MARINE REVIEW

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GRAIN GROWERS ENDORSE SHIPPING BILL.

The National Grain Growers' Co-operative Association of America has just added a powerful argument to the many already advanced in favor of the passage of the shipping bill. It has been the delight of the opponents of the bill to represent that it taxed all interests for the benefit of one, and the wise ones among them have sagely asked what harvest would the vast agricultural interests of the country reap from the measure. The answer has been abundantly given by the Grain Growers' association which represents an annual production of $4,000,000,000. In its resolutions just adopted the association says.

Resolved, that foreign markets be secured and extended at the earliest possible moment that will consume the surplus crops of the nation, and not leave us at the mercy of practically one nation in Europe to buy our surplus crops, who are thus enabled by lack of international competition to set such low prices on our export crops that it fixes the same low prices on the entire crop raised, which for the past few years has been about what it has cost us to produce. The foreign market that we can secure and which we are most anxious to have for our customers are the Pacific ocean or Asiatic countries.

Resolved, that we believe the most practical and effective manner to secure foreign markets and hold them would be through the agency of American ships engaged in this trade.

Recognizing the immense disadvantage our ships would have to encounter in securing a foothold in this commerce which is now practically done by foreign ships or 92 per cent. of entire commerce, who are generously subsidized by their respective governments and who are now absorbing about $200,000,000 annually that we pay them for carrying our products to market.

We will be obliged to meet this condition and pay a bounty or subsidy of such proportion as will effectively place our ships on equal footing with their foreign competitors. We desire that this bounty or subsidy be so arranged that it will be paid the vessels actually engaged in carrying the freight to market and be made so generous to this class of ships that it would attract the building of ships of this character. We are interested in our export trade because we contribute about 70 per cent. of the entire export trade of this nation from the farm.

We believe then that the interests of agriculture will be benefited by the building of American ships as it will aid in extending our foreign market and reduce the freight rates at sea on our products, while advancing the value of our entire crops by creating international competition for the sale of our crops, while giving a large and profitable field for the American mechanic and laborer, and an opportunity of attracting capital to one of the most extensive enterprises left undeveloped in this nation, while placing us at the same time in the ranks of a great commercial nation, and furnishing us with a fleet of American-built vessels that would be of great value to the nation in time of war.

The effect of the passage of the shipping bill would doubtless be to stimulate local production and to develop foreign trade, and there is not a citizen of the republic living who would not, directly or indirectly, be benefited thereby.

PROPOSED CHICAGO-BUFFALO STEAMERS.

John Gordon of Buffalo, who has had a great deal of experience in the management of passenger vessels on the great lakes, has had in mind ever since he built the North West and North Land for the Northern Steamship Co., the establishment of a line of passenger steamers between Chicago and Buffalo. He is again trying to secure capital for this enterprise. The newspapers quote him as saying that the money is assured, but of course big undertakings of this kind, involving probably a couple of million dollars, are not given much attention until the names of people providing the funds are announced. Mr. Gordon's friends certainly hope, however, that he has been successful.

The kind of ship proposed (two of them) is a steamer that might be applied to freight traffic in the spring and fall when there is no passenger business. It is planned to have each steamer make one round trip a week between Buffalo and Chicago, stopping at Milwaukee, Mackinaw, Detroit and Cleveland. The name proposed for the company is Great Lakes Transportation Co., and for the steamers, Great Eastern and Great Western. Mr. Gordon says he would have steamers of 450 feet keel, 470 feet over all, 50 feet beam and 29 feet depth. When in passenger service the draught would be about 14 feet with 2,000 tons water ballast; when in freight service, 18 feet with 5,000 net tons of cargo. The speed expected with single-screw engines of 5,000 horse power is 18 knots. It is said that the Chicago Ship Building Co. has prepared plans for the vessels. The name of W. E. Haupt, attorney of Buffalo, is also connected with the project.

REVENUE CUTTER FOR THE PACIFIC COAST.

Bids will be opened in the office of Capt. C. F. Shoemaker, chief of the revenue cutter service, on April 3, for the construction of a revenue cutter for the Pacific coast. This cutter was thoroughly described in the naval edition of the Review. She will be a sheathed ship of the poop and forecastle deck type and of the following general dimensions: Length over all, 205 feet 6 inches; length between perpendiculars, 188 feet 6 inches; beam, molded, 32 feet; beam, extreme, 32 feet 10 inches; depth at side amidship, 17 feet. The vessel is to be of steel throughout and will be fitted with eleven transverse water-tight bulkheads. She will be propelled by one vertical, inverted cylinder, direct acting, triple expansion engine, having cylinders of 25, 37½ and 56¼ inches diameter with a stroke of 30 inches. She will be fitted with four single ended, steel boilers of the Scotch type, 11 feet 8 inches outside diameter and 10 feet long over all. The vessel is expected to make 18 knots under full steam.

LABOR SKY IS CLEARING.

In shipping circles on the great lakes the sky is clearing as to labor troubles which have been most feared on account of the enormous business that is laid out by all kinds of contracts for next season. For a week past the sixth floor of the Perry-Payne building, Cleveland, which is occupied entirely by the offices of M. A. Hanna & Co., has been crowded with representatives of the different organizations of labor employed on the coal and ore docks of Lake Erie. The elegant offices of Ohio's famous representative in the United States senate have served in his absence as a meeting place for labor and capital. W. G. Pollock, D. R. Hanna, H. G. Dalton and other representatives of the ore and coal interests of the lakes have been holding day and night sessions with President D. J. Keefe of the 'longshoremen's union and his associates. There was evidence on both sides all through the conferences of an earnest desire to arrive at a fair settlement of wages for the different classes of dock labor, and although the matter is not yet at an end, it is more than probable that a satisfactory agreement as to wages has been reached and that only details are yet to be finished. The ore shovelers will be paid 14 cents a ton, as against about 10½ cents at the beginning of last season and 12½ cents at the close of the season. This will mean that the unloading charge to vessels will be advanced from 16 to 20 cents and maybe to 21 cents a ton. The difference in the advance to the vessels as against the labor increase is due to the fact that when the ore shovelers were given an advance of 1½ cents a ton last summer the dock managers did not feel justified in advancing the charge to the vessels, on account of the low freights in contracts under which the bulk of the ore was being carried.

In Cleveland during the balance of the present week the question of grain shoveling, which is of great interest to a vast army of workmen at Buffalo, will be taken up by a committee of the Lake Carriers' Association, consisting of L. C. Waldo of Detroit, chairman; James Corrigan of Cleveland; Edward Smith, M. M. Drake and Charles A. Braun of Buffalo; D. Sullivan of Chicago, W. E. Fitzgerald of Milwaukee, Howard Shaw and Thomas Cranage of Bay City, and A. W. Colton of Toledo, with Harvey D. Goulder of Cleveland, as counsel for the vessel owners. There is nothing definite in this matter as yet, but it is thought the Lake Carriers' Association will undertake the work through a superintendent and that the place will be given to Thomas W. Kennedy of Buffalo who is connected with the Philadelphia & Reading Ry., and is well known on account of his successful management of coal shipping affairs at Buffalo.

In the meantime everything pertaining to vessel freights for next season seems to be even stronger than when the big contracts were made several months ago. Vessel owners are still refusing to accept coal contracts at the rates proposed by the shippers. On a few cargoes of coal to be loaded at once for the head of Lake Superior 60 cents has been paid. This is 10 cents better than the contract rate, but it is due in part, very probably, to the fact that coal loaded now will escape an advance of 10 cents a ton rail freight from mines to lake ports. Some coal is being loaded for Milwaukee on the understanding that the vessels are to be paid the opening rate, which the vessel owners say will very probably not be less than 70 cents. Vessel owners who look for high freights on Lake Michigan coal say that the Buffalo coal shippers will not have next season the large fleet that traded regularly between Chicago and Buffalo in the grain trade, on account of so much tonnage having been contracted for ore, and they therefore hope to see the shippers of hard coal bid up the rates as they usually do when they want vessels.

BESSEMER STEEL PRODUCTION.

Statistics of Bessemer steel production in 1899 have just been issued by General Manager Swank of the American Iron & Steel Association. The total production of Bessemer steel ingots in 1899 was 7,586,354 gross tons, against 6,609,017 tons in 1898, showing an increase in 1899 of 977,337 tons, or over 14 per cent. The production in 1899 was very much the largest in our history. It was more than twice the production of 1894, and was almost twice the production of 1896. Of the total production in 1899, 3,939 tons were steel castings, against a similar production in 1898 of 3,539 tons.

The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1899 was 2,240,767 gross tons, against a similar production in 1898 of 1,955,427 tons and 1,614,399 tons in 1897. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1899. The year of next largest production was 1887, twelve years ago, when 2,044,819 tons were made. These figures do not include rails made from purchased blooms or rerolled rails. The total production for 1899 will also include rails made from open-hearth steel and iron rails. When all the figures are obtained it will probably be found that our total production of all kinds of rails in 1899 was about 2,300,000 tons.

MUST RECORD COLLISIONS AT ONCE.

Eugene T. Chamberlain, commissioner of navigation, has notified collectors of customs and shipping commissioners of an amendment to the act relating to log entries, which provides that in every case of collision in which it is practical to do so the master shall, immediately after the occurrence, cause a statement thereof, and of the circumstances under which it occurred, to be entered into the official log book. Failure to do so subjects the master to the same penalty as is prescribed for failure to observe the other entries, such as the record of births, deaths, trials and prosecutions on board.

This law is evidently intended to prevent the fixing up of evidence in collision cases after statements of crews are heard. The captain's record in the log, witnessed by the mate or other officer of the vessel, and made in advance of a protest or other legal documents prepared with the assistance of attorneys, would cut an important figure in court.

HAMBURG-AMERICAN LINER DEUTSCHLAND.

It is expected that the steamer Deutschland of the Hamburg-American line will enter service between New York and Hamburg in June next. As already announced in the Review, this great ship was launched a few weeks ago from the Vulcan yards at Stettin. The vessel was designed to excel anything afloat in point of speed. Her general dimensions are: Length, 686½ feet; width, 67 feet; depth 44 feet, while her net registered tonnage is 16,000 and her displacement 23,000 tons. She will be equipped with bronze twin screws, 23 feet in diameter, and two quadruple expansion engines of 35,000 horse power with which she is expected to make an average speed of 23 knots. Steam will be supplied to the engines by twelve double and four single-ended boilers and there will be in all 112 fires. Four huge funnels and two pole masts of steel rise from the deck. Her decks, of which there will be six, will be constructed of the best steel and teak wood.

The Deutschland will be provided with a longitudinal bulkhead and numerous transverse bulkheads, by which her hull will be divided into seventeen water tight compartments. As a safeguard in case of grounding, there will be a double bottom subdivided into twenty-four chambers. The vessel will have accommodations for 467 first-cabin, 300 second-cabin and 300 third-class passengers.

MATERIAL CAN NOT BE OBTAINED FOR WAR SHIPS.

"Briefly, our navy estimates for 1900-1901 amount to a net total of £27,522,600," says the Shipping World of London, "being an increase of £928,100 beyond the amount voted for the last year's requirements of the naval service. In so far as they relate to new construction, the estimates for the coming financial year are none too liberal, even if they are adequate for our needs. Two battleships, six first-class armored cruisers and one second-class cruiser, together with half a dozen small craft, will certainly not overburden our ship building resources; nor does the amount for the estimated expenditure on new construction for the coming year compare favorably with last year's total, it being, exclusive of establishment charges, less by £395,333 than the sum voted for the same purpose in the present year. The figures are £8,460,146, as against £8,855,481 for 1899-1900. Against this is the set-off that the smaller sum is larger by £1,131,179 than the anticipated actual expenditure for this year, namely, £7,328,967, and if this larger sum should be spent in 1900-1901, it will represent an expenditure larger by more than a million pounds than has ever yet been reached. Let us hope that the admiralty's anticipations regarding more rapid work in the future will be realized, otherwise we shall have a still further accumulation of unfinished ships, and the arrears in this respect are already serious enough.

"With the ships now building and the new construction contemplated, we shall have seventy-six vessels in hand for the navy in the course of the year. Of these twenty-five are torpedo craft and two are light-draught gunboats. Of the remainder seventeen are battleships, twenty are armored cruisers, one is a first-class, and two are second-class protected cruisers, one is a third-class cruiser, and eight are sloops. Personally, we incline to the belief that this is sufficient for our present needs if the nation can have some reliable guarantee that the whole of this work will be pushed to completion with the least possible delay.

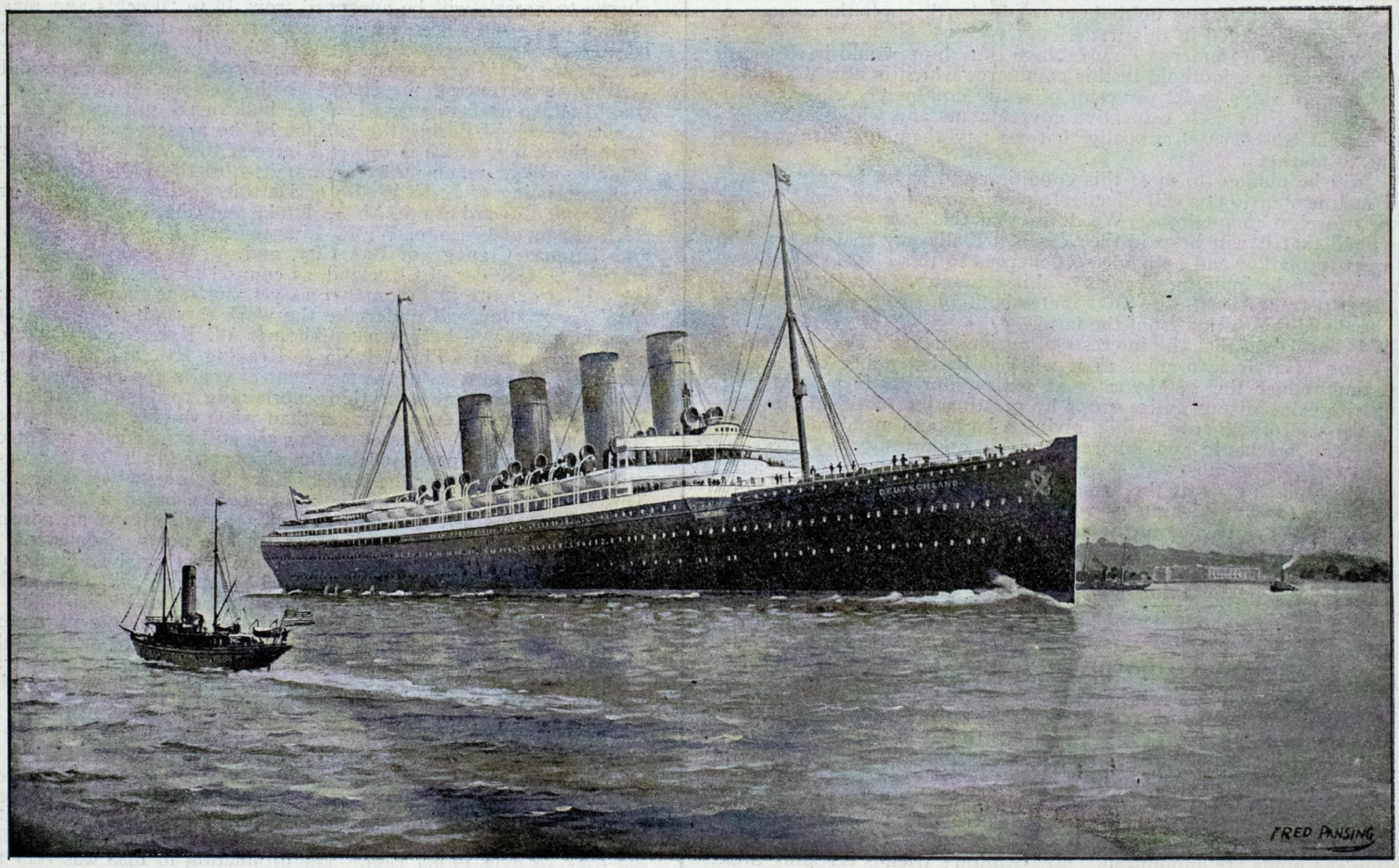
"In regard to the personnel of the navy we should certainly have liked to have seen a greater increase than that made, namely, 4,240, in the total number voted for the year 1900-1901, which is 114,880. With the numbers borne in the naval reserve standing at 1,000 below the number voted, 25,712 and 26,750 respectively, we have not the requisite surplus of men to draw on in the unhappy event of any emergency arising. In framing their annual estimates, we are afraid that the lords commissioners of the Admiralty overlook the fact that our seamen gunners take longer to train than do our battleships and cruisers to build."

ADMIRAL DEWEY ON THE AMERICAN NAVY.

Admiral Dewey was the guest of honor at the annual dinner of the New York commandery of the naval order of the United States at Delmonico's on Saturday night last. Among the distinguished men present were Capt. A. T. Mahan, the Rev. George Williamson Smith, president of Trinity College, Rear Admiral George E. Belknap, Rear Admiral Joseph E. Miller, Col. W. C. Church, Capt. Taylor of the Indiana, Capt. Chadwick of the New York, and Capt. John R. Bartlett. Lt. Com. Chenery presided. Admiral Dewey in responding to the toast "The American Navy," said:

"The American navy has entered on an era of its history which promises to be even more glorious than its brilliant record of the past. I have noticed an increased interest in our navy all over the country, especially in congress. An instance of this was afforded the other day. When I was before the naval committee the members listened to me and my suggestions with such intense interest that I believe anything that I might have suggested would have been carried out, even to the building of a dozen battleships."

Other toasts were: "Our Old Navy," Rear Admiral Belknap; "Our New Navy," Capt. H. C. Taylor; "Our Navy in the Future," Capt. A. T. Mahan; "Our Empire State," Lieut. Gov. Woodruff; "The Naval Reserves," Capt. Jacob W. Miller; "The Builders of the New Navy," Capt. F. L. Humphries. Gov. Roosevelt made a brief impromptu speech.



HAMBURG-AMERICAN LINER DEUTSCHLAND, BUILDING AT STETTIN FOR HAMBURG-NEW YORK SERVICE.

NORTH GERMAN-LLOYD CO. TO ADOPT WIRELESS TELEGRAPHY.

It is reported that the North German-Lloyd line will adopt the Marconi system of wireless telegraphy on its fast vessels as a means of communicating with the land when approaching ports of destination each side of the Atlantic. The plan of Gustav H. Schwab, general managing agent, is to urge the erection of a lofty mast on the Nantucket south shoal light-ship about 240 miles from Fire island. This will enable steamships to communicate with New York fifteen or sixteen hours before they reach their piers.

A series of experiments conducted on the Kaiser Wilhelm der Grosse recently was entirely successful. A sprit was run up from the mainmast until its tip was 135 feet above the deck and satisfactory communication with Borkum island in the mouth of the Ems was held by one of Marconi's electrical engineers. It is proposed to step a spar on the Sicily islands. The system is to be extended to public use.

The North German Lloyd Steamship Co. has bought the steamers Ellen Rickmers, Maria Rickmers and Elizabeth Rickmers of Bremerhaven, Germany. The names of the steamers have been changed. The Ellen Rickmers is now the Borkum, the Maria Rickmers is the Helgoland and the Elizabeth Rickmers the Nordensey. The Borkum sailed from Bremen last Saturday for New York.

MONROE DOCTRINE AND OUR NAVY.

Capt. A. T. Mahan in an article in the current issue of Leslie's Weekly on the subject of "The Monroe Doctrine and Our Navy" says:

"The settlement and growth of our Pacific coast, the increasing commercial consequence of the Pacific coast, and the questions arising about China, its future government and its trade, make it necessary to connect our Atlantic and gulf seaboard with the Pacific by a canal across the Central American isthmus, establishing thereby a consecutive water communication between the two, as well as shortening the access from our eastern shores to Asia. The isthmus and its immediate surroundings thus become the greatest of our external interests. Scarcely secondary to them is the Caribbean sea, because all sea roads to the isthmus run through it, and it contains many strong positions, the acquisition of which by a formidable European state would in war endanger our shipping—mercantile and naval alike—passing between our Atlantic ports and the Pacific by the canal.

"We must remember that other nations, and especially European—because the most active—are interested likewise in using that canal, and for the support of their interests in gaining positions. To their doing so we oppose the Monroe doctrine. Therefore, if we intend to make good the affirmations of the latter, we must be prepared to resist, forcibly if need be, any attempt to obtain adjacent territory or ports which may serve as stations for a navy hostile to ourselves. It is natural that European nations should wish such positions; that Germany for instance, as has been lately rumored, should wish the Danish islands—St. Thomas, etc. Her right to buy them is as good in international law as ours; the Monroe doctrine depends not upon legal right, but upon the moral right of our indispensable interests, and derives its chief support from the fact that it is not worth while to incur our enmity, pushed perhaps to the extent of war.

"Now the one preparation for war, in a maritime region like the Caribbean, is a navy large enough to be effective. Ports are quite secondary. They are necessary to a navy which needs a local base of operations; but they are useless without, especially in the Caribbean, because conditions there are so backward as to give no local resources. Positions held there not only must be fortified, but everything to support shipping must be imported, and a steady stream of supply maintained. This can only be done by the navy keeping the sea open, while at the same time securing our other merchant shipping. To do these things, which is called controlling the sea, the navy should, strictly, be superior to any which can be brought against it; but this extreme conclusion is qualified by other circumstances, such as our nearness to the Caribbean sea, our national power through our great resources, the dangers to which our possible opponents may be exposed in other quarters and from other enemies. We cannot in the near future expect to have a navy nearly as large as that which Great Britain must keep, but it is easily within our means to rival that of France or Germany. the only European states, other than Great Britain, whose general interests might lead them actively to dispute the maintenance of the Monroe doctrine.

"Reflection upon this condition will indicate the size necessary to our own war fleet, and also the wisdom of cultivating those cordial relations to which Great Britain has invited us which our interests and our institutions advise, and the existence of which will put it out of the power or wish of any other state to quarrel with us about the Monroe doctrine. It is to the interest of Great Britain that we should take naval charge of the American isthmus, provided she can feel sure that we will do it effectively; that our preparations and our deeds will answer to the words of Washington and Monroe."

INFORMAL TALK ON COMPRESSED AIR.

BY J. L. PILLING.†

It has been my privilege in connection with my avocation to visit about all the establishments where compressed air is used in the United States, and without fear of contradiction I will say that with very few exceptions I have not seen a properly constructed air plant in my travels. The theoretical points of air compression have been understood from time immemorial, but the most essential, practical and economical points which are in demand today have not been touched upon.

Compressed air will go as much below its normal temperature in expansion as it goes above in compression; therefore the larger the exhaust port and shorter the exhaust passage the less liability of icing up the tool. Air compressors are as near perfect as we may expect to see them for years to come. The trouble lies not in the compressor but in the manner in which the compressor is connected up to the receiver and taken therefrom. A receiver is not for an accumulation—as many think—only at the third stage. First it is for condensing surface; second to take care of the pulsation of the compressor, and third for an accumulation.

By all means connect discharge pipe from the compressor near the top of the receiver. Take the outlet to the main line about one foot from the bottom of the receiver. Have the receiver so placed that the outside atmosphere can circulate around it. Have a blow-off cock with a very short connection at the bottom. If conditions are such that a horizontal receiver must be used, connect the discharge from compressor on top of the receiver at one end; connect the outlet to the main line at the other extreme, but as low as possible, as long as it is above the fore and aft line of the receiver.

Why all this? On a clear day there are eight grains of water to a cubic foot of air, and foreign matter in suspension. Through the compression heat is generated. Heat will always rise. As long as the air is above its normal condition in temperature the moisture and ingredients are in suspension. Moist air is a friction; moist steam is a lubricant. It will therefore be readily understood what a receiver is for, and why it should be connected up as I have already stated. If under these conditions the air is still warm as it leaves the receiver, then the receiver is not large enough, or the compressor is too small, or both. This argument will hold good even if an intercooler is used as on a compound compressor. Precipitate the moisture in your receiver—that is what it is for. By so doing you will have no trouble with your main line freezing, and you will obtain better results from your pneumatic tools which are as finely constructed as any piece of mechanism on earth. Treat them as such; give them good dry air; increase their efficiency by so doing, and lessen your repair bill.

†Mr. Pilling is with the Q. & C. Co., Chicago.

W. A. Collier, Gen. Mgr. R. P. Thompson, Sault St. Marie. M. H. Wardwell, Secretary. Le. Brogan, Cleveland. L. Lautenslager, Chicago. W. H. Hill, Erie. T. F. Newman, President. Philip Schied, Ashtabula.
S. E. Leonard, Lorain. B. B. Inman, Duluth. J. R. Sinclair, Chicago. Geo. Bartley, Escanaba. A. S. Hand, Conneaut.

OFFICERS AND MANAGERS OF THE GREAT LAKES TOWING CO.

NAVY TO PURCHASE TOOLS.

A Washington special says that tool builders may soon expect another large order from the navy department. The deficiency bill, which recently passed congress, carried with it an appropriation of about $2,500,000 for the bureau of construction and repair and as only four months remain in the official year it is understood that Admiral Hichborn has instructed his representatives at the navy yards to prepare their list of tools at once in order that contracts may be made for them out of the deficiency appropriation. It is not likely that the department will advertise for the tools but will buy them through the navy purchasing officials.

SHIPS FOR THE GREAT NORTHERN.

TO BE BUILT AT A NEW WORKS IN NEW LONDON, CONN.—JAMES J. HILL'S PLANS FOR A BIG TRADE WITH CHINA, JAPAN AND THE PHILIPPINES.

The Eastern Ship Building Co., which is to build as soon as possible two large steamers for James J. Hill of the Great Northern Ry., to cost together about $5,000,000, has opened offices at New London, Conn., and has about arranged for the purchase of a site for a ship building plant on the Thames river at that place where vessels of the largest size, merchant and war, may be built. As yet only the names of Charles R. Hanscom and W. A. Fairburn are officially connected with the company. Both of these gentlemen are well and favorably known to ship builders throughout the United States. They are thoroughly versed in everything pertaining to the construction of vessels. Both were connected with the Bath Iron Works—Mr. Hanscom as general superintendent and Mr. Fairburn as chief draughtsman—up to a few days ago when they resigned to take up the new enterprise. It is announced that Mr. Hanscom is to be president and general manager of the new company, with Mr. Fairburn as his assistant. It is also officially announced that the ship yard is being established upon the order from Great Northern Railway interests for two large steamers, but further than this Mr. Hill's connection with the undertaking is not definitely stated as yet. There is no doubt of the advantages of New London as a ship building site. It will be remembered that it was proposed not long ago to move the Bath works to that place. Quarters in New London where work on plans of the new ships is to begin at once are already being arranged by Mr. Fairburn. It is expected that the two vessels, which will be among the largest in the world, will be completed in about two years. They will be of about 600 feet length and 70 feet beam with five decks. They will not be built for speed. They are expected to average 12 knots in ordinary working, and to be capable of making 15 or 16 knots in an emergency.

CHAS. R. HANSCOM.

The foregoing are facts reported from New London. From other sources it is said positively that Mr. Hill is directly connected with the enterprise and that he will build at the new works the cargo steamers that were designed for him in England and that are to run between the terminus of the Great Northern Ry. on Puget sound and the ports of China, Japan and the Philippine islands. Speaking of the possibilities of the Japan-China trade Mr. Hill said recently:

"I propose to build as many vessels as the trade with the Orient will justify and that will be a great many. The natural market for the Pacific coast is China, Japan and the Philippines. The docks at Seattle are large enough to accommodate all the shipping for some time but eventually the conditions will warrant more extensive harbor improvements. It is too far from the Pacific coast to the eastern states to ship many of the northwestern products to the east. A market for grain in the Orient will give the farmers a price higher than they can get in the east. The products of the iron and coal mines and lumber regions in the northwest can be sold to better advantage in the markets of the Orient than they can bring in the east. It is not like forcing something upon the market that people don't want. They want everything we can take to them and we want their products. We shall have twenty-five steamships in the service within the next five years. The vessels will be of the largest size, with enormous carrying capacity and comparatively slow speed. Speed is not so much of an object as to be able to lay the goods on the other side of the Pacific so that they may compete with native products."

PERSONAL.

Mr. William A. Fairburn of Bath, Me., who is to be connected with the management of the new ship building company at New London, Conn., recently declined the chair of naval architecture and marine engineering at the University of Michigan. Mr. Fairburn concluded that his future was brighter in the ship and engine building business.

K. E. Voorhes has resigned his position with the New York Ship Building Co., and is now with the Sharon Steel Co.

Mr. Charles R. Hanscom, who is to be president of the new ship building company at New London, Conn., has resigned the position of general superintendent of the Bath Iron Works, and has been succeeded by Mr. John S. Hyde.

Mr. T. A. S. Dyer, who represents the Egyptian government, has been in Pittsburg the past week inspecting the steel for the six large coal hoisting machines which the Brown Hoisting & Conveying Machine Co. of Cleveland is to construct for his government. The steel is being manufactured by the Carnegie Steel Co.

Lieut. Com. G. B. Harber of the naval intelligence office and Constructor J. J. Woodward, now on duty in England, have been designated by the navy department to represent the United States at the congress of naval architects to be held in Paris during the exposition.

Rear Admiral A. H. McCormick, who was recently assigned to duty as second in command of the Asiatic station under Admiral Remey, has been placed on the retired list on his own application. His health is somewhat impaired.

Lieut. W. H. Sims will shortly be detached from duty as naval attache at Paris and will be succeeded by Commander G. B. Harber, now on duty in the naval intelligence office.

ALL ABOUT GRAIN.

A REPORT FROM THE TREASURY DEPARTMENT THAT DEALS WITH PRODUCTION AND TRANSPORTATION OF THE GREAT STAPLES—WONDERFUL GROWTH OF EXPORTS.

"The Grain Trade of the United States" is the title of a monograph just published by the treasury bureau of statistics as the first of a series of studies upon the production and transportation of the great staples and upon the internal commerce of the country. The present article points out the immense increase in the agricultural production of the country, the rapid and continuous westward shifting of the area of cultivation, and the changes in the routes by which western grain reached the eastern consumers and the European markets. The development of the grain production and trade is traced from colonial times to the opening up of the Mississippi route by the purchase of Louisiana, when the shallow barges and later the steamboats descended the Mississippi, and New Orleans shipped grain to New York and Boston. After the completion of the Erie canal in 1825 and the settling of the Lake Michigan territory, the great bulk of the western grain traffic moved eastward over the lakes and the canal, and New York became the great grain shipping port of the country. The discussion shows how from Chicago a network of railways radiated to all points and acted as tributaries to the lakes, and later how the unified and amalgamated railways competed with the lakes for the east-bound traffic. The traffic in corn and flour was diverted from the lakes to the railroads, and while the lakes regained part of this lost traffic later, the Erie canal was unable to compete with the railroads from Buffalo, and grain which formerly reached tidewater at New York is now largely diverted to Philadelphia, Baltimore, and more southerly ports. The struggles of the railroads and of the ports among themselves are described and the history of the existing rate differentials is given, but the report confines itself to history and does not discuss policy or forecast future developments.

The monograph also presents what appear as the two most recent developments of the grain trade of the United States: firstly, the partial diversion of the wheat and flour trade from Lake Michigan to Lake Superior ports and the rise of a great milling industry at Minneapolis and Duluth-Superior; secondly, the increased movement of grain (and notably of corn) to the gulf ports, partly by river, to a greater extent by rail from St. Louis and near by points and to an ever-growing extent by direct rail routes from cities in the southwestern corn belt. Another feature of the report is a series of tables dealing with the rise and development of the grain trade at various collecting and distributing points, the efforts of the several railroads to control and effect the ever increasing transportation of grain and the distribution of the traffic among the various routes. A great amount of information is furnished about rail, canal and ocean freight rates; about the production, distribution and consumption of cereals, and a special paragraph is devoted to the subject of the foreign market for American grain. The monograph includes a number of tables regarding acreage, production, imports, exports, consumption, prices and rates of duty for wheat in all the principal countries of the earth, as well as a map showing in general outline the present wheat area of the world.

Statistics contained in this report throw light upon the present grain and more especially wheat situation of the United States. They show that the exportation of grain is increasing with great rapidity, that both the production and exportation of corn are assuming a greater volume and that a constantly growing portion of our wheat is exported in the form of flour. During the last thirty-two years the amount of corn produced has increased from 868 to 1,924 millions of bushels, an increase of 122 per cent, while the exports of this cereal increased from 16 to 177 millions of bushels, or over 1,000 per cent. During the same period our production of wheat increased from 152 to 675 millions of bushels, a gain of 344 per cent., while our exports increased from 12.6 to 222.6 millions of bushels, or almost 18 fold and our net exports of this grain increased at a still more rapid rate.

From this report it also appears that since 1875, and notably since 1880, an ever increasing proportion of our wheat exports has been in the form of flour, and that in this important branch of manufacture Americans have been able to compete with European millers, even in the face of adverse legislation abroad. In 1880 only 15.03 per cent. of our wheat was exported in the form of the manufactured product, flour, while in 1899 the proportion was 37.39 per cent. and in 1896 52.03 per cent. In 1876 less than 4,000,000 barrels of flour were exported; in 1899 over 18,000,000 barrels were exported.

The year 1898 shows the United States to be easily the first wheat-producing country of the world, our production amounting to 675,000,000 bushels, or nearly one-fourth (23.4 per cent.) of that of the whole world. Russia (both European and Asiatic) is second with 17.3 per cent.; then France with 12.9 per cent.; British India with 8.4 per cent., and Austria-Hungary with 5.9 per cent. Our precedence in wheat production is largely due to our immense tracts of available fertile land, our admirable transportation facilities, the remarkable system of handling the grain, both physically and commercially, and the exceedingly low freight rates which obtain on our railroads and lakes.

Corrigan, McKinnie & Co. of Cleveland, have certainly forged to the front wonderfully in iron mining and vessel lines within the past six or eight months. They are now operating three mines on the Mesabi range, five on the Gogebic and eight on the Menominee, sixteen in all, from which a product of about 1,500,000 tons of ore is expected during the coming season. Every variety of ore is represented in the list, and some of the mines which they have opened up are of great promise. They are operators in all cases, not agents. Corrigan, McKinnie & Co. now have twelve vessels, in addition to twelve others owned by James Corrigan.

Senator Sewall has introduced a bill in the senate changing the name of the American line steamer Paris to Philadelphia. Senator Sewall points out that three of the fleet ships of the International Navigation Co., now bear the names of American cities and it is desired to have the name of this vessel with them. The Paris has been thoroughly repaired at a cost of over $1,000,000 since she ran on the Manacles last summer.

AROUND THE GREAT LAKES.

Steward Murray of Buffalo has resigned the position of freight and passenger agent of the Northern Steamship Co.

Benjamin Trudell is the keeper of the new life saving station at Grand Marais, Mich. The station was built at a cost of $5,000.

The bill to establish a light and fog signal station at the southern entrance of the new breakwater at Buffalo has passed the house of representatives.

W. Askin of Sarnia succeeds A. Miscampbell as manager of the Northern Navigation Co. of Collingwood, Ont. Mr. Askin has been connected with the Beatty line for several years.

One of the two 500-foot freight steamers building at the West Bay City works of the American Ship Building Co. for the American Steamship Co., A. B. Wolvin, manager, will be launched shortly. It is proposed to cut a hole 500 feet long into the ice in order to facilitate the launching.

The Green Bay Vessel Co. of Green Bay, Wis., will build a first-class tug about the size of the George D. Nau. Plans have been prepared and work will be started as soon as the large steamer now being constructed in the north side yard is launched, which will be a matter of a few weeks.

It is announced from Toronto that the Bertram Engine Works Co. is to build another passanger steamer of large dimensions for the Richelieu & Ontario Navigation Co. Two steel freight steamers of Welland canal dimensions which are under construction at the Bertram works—one of them for the Canada Atlantic Transportation Co.—were fully described in the recent ship building edition of the Marine Review.

Although the few ship owners who are not tied up to contracts are hoping as usual for a late opening of navigation, on account of the favorable effect which it would have on freights, it is quite evident that on the very first signs of ice breaking up, vessels will be sent out from all parts of the lakes. Engineers of some of the big lines are already preparing to fit out their boats. Pickands, Mather & Co. of Cleveland have started their engineers to work.

Members of the American Association of Masters & Pilots of Steam Vessels on the great lakes are trying to organize a system of insurance similar to that of the Ship Masters' Association. The plan is to confine the matter to the lake harbors, of which there are seven—Buffalo, Cleveland, Detroit, Bay City, Port Huron, Duluth and Chicago. A committee of the Cleveland harbor, consisting of Lee Brogan, C. A. Benham and Wm. F. Allen, has the subject in hand.

The Kingston Dry Dock Co. of Kingston, Ont., has just closed a contract for a yacht for a member of the St. Lawrence yacht club at Montreal. The vessel is to be 65 feet long, intended to navigate in shallow waters, the draught not to exceed 2 feet. The ordinary speed is to be 10 miles per hour, power to be obtained from a Davis water-tube boiler carrying 200 pounds pressure, and an 8 by 8-inch high pressure engine. The vessel will cost $3,000.

Probably nowhere in the country is a new light-house tender so badly needed as in the eleventh district, which covers the Detroit, St. Clair and St. Mary's river, as well as Lakes Huron and Superior. The vessel owners have been urging the charter of a vessel to deliver coal and other supplies to light houses in this district, so that the regular tender may give more time to gas buoys. Senator McMillan is looking after legislation for a new tender. An estimate has been submitted to congress by the light-house board.

The fleet of the Canada Atlantic Transportation Co. of Chicago for the coming season will be made up of the following vessels: Arthur Orr, 4,800 tons; G. N. Orr, 4,200 tons; W. H. Gratwick, 4,200 tons; Kearsarge, 4,500 tons; new boat now building at Toronto, not yet named, 3,300 tons. Total gross tonnage of new fleet, 21,000 tons, as against 17,000 tons for 1899, or an excess of 4,000 tons a trip, or about 100,000 tons eastbound for the season. The steamer now being built in Toronto will be 257 feet over all; beam moulded, 43 feet; depth moulded, 25½ feet; estimated capacity, 3,000 gross tons; engines, triple, 17.28, 46x32; 1 Scotch boiler, estimated horse power, 750.

The H. W. Williams Transportation Co. of Chicago has been reorganized as follows: H. W. Williams, president; J. G. Wiley, superintendent; C. W. Williams, secretary and treasurer; W. K. Greenebaum, general passenger agent. The offices of the company will be moved to the building now occupied by the Lake Michigan & Lake Superior Transportation Co., and the steamers of the Williams line will tie up at the Lake Michigan & Lake Superior dock, north of Rush street bridge. The side-wheel steamer Darius Cole, which saw service last year between Port Huron and Detroit, will be added to the fleet, which will therefore consist of the Darius Cole, H. W. Williams, City of Kalamazoo and Glen. The line runs from Chicago to South Haven.

At last some definite action is being taken relative to the dangers of navigation in Chicago harbor on account of the drainage canal. The engineering committee of the drainage board, composed of all the sanitary trustees, on Wednesday last adopted by unanimous vote resolutions declaring for the assumption of control of the main channel and the south branch of the Chicago river, the removal of all center pier bridges and their replacement by draws of bascule type, and the policing of the stream by dispatch boats to direct the movements of vessels in the best interests of navigation. Every aid will be given to the city authorities in their effort to cause the lowering of the tunnels. The entire committee will confer with Mayor Harrison and Commissioner of Public Works McGann to form a definite plan of campaign. The immediate removal of the old bridges can begin as soon as bonds to the amount of $3,000,000 are issued for this purpose.

On the claim that some of the best masters of vessels on the great lakes, men of years of experience, might make a very poor showing if compelled to submit to an examination in writing, the Ship Masters' Association is opposed to the rule of the steamboat inspection service, adopted some time ago, which provides for written examinations upon renewal of licenses. It is urged, and rightly so, that many ship masters who have been highly successful and who are thoroughly versed in everything pertaining to the operation of a ship, have come up from the bottom of the ladder, and would therefore be unable, very probably, to put in writing to the satisfaction of some inspectors all that they know about the rules of the service. This is why Capt. A. J. McKay of Detroit, president of the Ship Masters' Association, accompanied by Capt. R. E. Byrne of Cleveland, is in Washington with a view to making arrangements, if possible, for a repeal of this ruling at the next annual meeting of the supervisors.

Every available man is being worked extra hours in the Orleans street shops and in the Wyandotte yards of the Detroit Ship Building Co., in the effort to fill contracts. At the dry docks the steamers City of Buffalo and City of Erie of the Cleveland & Buffalo line are receiving a general overhauling; the steamer Lansing, owned by D. C. Whitney, has just received $6,000 worth of rebuilding; the Iron King has received a new boiler; the Minnesota is being generally overhauled and equipped with new boilers; the steamer A. A. Parker has been entirely recaulked and the steamer H. S. Pickands has been practically rebuilt from the light load line up. The upper works of the new river steamer Tashmoo are well under way, but it will be impossible to have her ready for service before June 1. The engine works are making the machinery for the new Lehigh Valley boat now being built at Buffalo, and a big contract for dredging machinery is being filled for a Seattle, Wash., dredging company. At the Wyandotte yards the finishing touches are going on the new steamer Admiral. The keels are laid and work is progressing on three large steel steamers, two 450-foot ore carriers for the Eddy Bros., and one of 475 feet for the Carnegie company. One of the Eddy boats is pretty well along.

MASTERS AND ENGINEERS.

APPOINTMENTS OF OFFICERS FOR SHIPS OF THE GREAT LAKES, SEASON OF 1900.

Pickands, Mather & Co., Managers for Minnesota Steamship Co., Cleveland: Steamers—Manola, Capt. John Nahrstedt, Engineer D. A. Black; Mariska, Capt. A. J. Talbot, Engineer David Buens; Maruba, Capt. F. J. Crowley, Engineer John Dupont; Marina, Capt. M. K. Chamberlain, Engineer W. A. Meddaugh; Matoa, Capt. C. H. Cummings, Engineer W. W. Tyler; Masaba, Capt. W. S. Chilson, Engineer A L. Wilcox; Maritana, Capt. A. P. Chambers, Engineer John McLaughlin; Mariposa, Capt. J. W. Morgan, Engineer F. A. Smith; Maricopa, Capt. Henry Zealand, Engineer B. F. McCanna; Mataafa, Capt. Frank Root, Engineer Theo. A. Myers; Mauna Loa, Capt. C. H. Bassett, Engineer Geo. Arnold; Malietoa, Capt. G. B. Mallory, Engineer P. J. June. Schooners—Malta, Capt. W. D. Graham; Marcia, Capt. ———; Manda, Capt. Chas. Van Gorder; Martha, Capt. Henry Gegoux; Magna, Capt. C. E. Copeland; Maida, Capt. A. G. Tappau; Maia, Capt. W. A. Reed; Manila, Capt. E. A. Hill; Madeira, Capt. John Collins; Marsala, Capt. Henry Culp.

Drake & Maytham, Buffalo: Steamers—Chili, Capt. James Gibson; W. H. Gratwick, Capt. Joseph Hulligan; Thomas Maytham, Capt. L. B. Cummings; Vega, Capt. A. Oldorff; America, Capt. Robert Gibson; Brazil, Capt. J. H. Smith; Lackawanna, Capt. F. Weinheimer; Scranton, Capt. James Green; Vulcan, Capt. J. N. Smith; J. W. Moore, Capt. Richard Nevill; City of Berlin, Capt. John Buie; Case, Capt. J. D. Peterson; Russia, Capt. John D. Green; Cuba, Capt. Robert Young; Alcona, Capt. W. T. Sutherland. Schooners—Antrim, Capt. Geo. McMinn; Tyrone, Capt. S. Kelly; H. W. Sage, Capt. John Lachlan; Alta, Capt. John McNamara.

Sicken, M., Marine City, Mich.: Steamers—Geo. King, Capt. Wm. Burns, Engineer Peter Britz; M. Sicken, Capt. John Kuhn, Engineer Wm. Sicken; S. K. Martin, Capt. Chas. Kobel, Engineer John Dashaw. Schooners—Teutonia, Capt. Harry Lawrence; Thos. Gawn, Capt. Julius Lawrence; E. J. McVea, Capt. Chartrau; Melvina, Capt. Harry Larsen; Spademan, Capt. Geo. Gullett; Levi Rawson, Capt. Jos. Kobel; Grace Whitney, Capt. John Lozenzen; St. Joseph, Capt. ———.

Moore, John W., Cleveland: Steamers—John W. Moore, Capt. R. Neville, Engineer A. G. Bohland; Louisiana, Capt. Truman Moore, Engineer Anthony Ward; Colonial, Capt. R. J. Neville, Engineer Geo. Masters; Marquette, Capt. E. D. Chilson, Engineer ———; Siberia, Capt. Frank B. Chilson, Engineer F. C. Burrows.

Lake Michigan & Lake Superior Trans. Co., Chicago: Steamers—Peerless, Capt. H. B. Page, Engineer J. R. Bennett; City of Traverse, Capt. John M. Twitchell, Engineer Edward Meeh; Jay Gould, Capt. Chas. Wilson, Engineer Henry Chalk; Osceola, Capt. Joseph White, Engineer James Oay.

Pickands, Mather & Co., Managers for Interlake Co., Cleveland: Steamers—Kearsarge, Capt. Robert McDowell, Engineer L. H. Sebastian; Victory, Capt. Fred Hoffman, Engineer Thos. Treleaven. Schooner—Constitution, Capt. William Holly.

Pickands, Mather & Co., Managers for Boston Coal Dock & Wharf Co., Cleveland: Steamer—Appomattox, Capt. Hugh Stevenson, Engineer E. J. Arnold. Schooner—Santiago, Capt. ———.

Pickands, Mather & Co., Managers for Huron Barge Co., Cleveland: Steamer—Pathfinder, Capt. D. H. Mallory, Engineer C. A. Heisnee. Schooner—Sagamore, Capt. C. C. Joiner.

McGraw Trans. Co., Bay City, Mich.: Steamers—City of Paris, Capt. E. D. Ballentine, Engineer Wm. C. McDougall; City of Venice, Capt. Chas. Ainsworth, Engineer G. A. McDougall

Smith, Wm. & Co., Waukegan, Ill: Steamer—Alice, Capt. Richard Smith, Engineer Henry Ernst.

Manitou Steamship Co., N. F. Leopold, Pres., Chicago: Steamer—Manitou, Capt. Allan McIntyre, Engineer R. L. Peck.

Andrew Carnegie is quoted in a recent interview as saying that the passage of the gold bill, inspiring confidence in the standard and the inevitable expansion of currency following, must maintain prices and probably cause a rise in securities. The situation in pig iron, he thinks, insures a continuance of present prices for finished product during the year. According to Mr. Carnegie the foreign demand, which would rapidly increase upon even slightly lower prices, serves as a reserve in preventing any serious decline in iron and steel.

THE SHIPPING BILL.

SENATOR FRYE REPLIES TO A NUMBER OF QUESTIONS ASKED BY THE EDITOR OF THE SAVANNAH NEWS—HE SHOWS A THOROUGH KNOWLEDGE OF THE SHIP BUILDING INDUSTRY.

Senator Frye has just replied to a number of pertinent questions propounded by the editor of the Savannah News regarding the shipping bill. The senator's reply is as follows:

"I am always glad to impart any information I have on public questions to any one who seeks it in a respectful way. The Savannah News is a paper that doubtless exercises a wide influence in Georgia, and its readers ought to be informed upon those points concerning which its editor seems to lack knowledge. For instance, the Savannah News asks me: 'Why is it that contracts for warships are given to American shipbuilders by foreign governments if ships can be built for less money in the ship yards of other nations?'

"I presume the editor of the Savannah News would scarcely think it fair were I to answer his inquiry by propounding another, to wit: Why is it if ships can be built in the United States as cheaply, or more cheaply, than they can be built abroad, that there is no case on record of a foreign steamship line having had a ship built in the United States, even in the case of lines running directly in our trade? Nevertheless, the one question is as fair as the other. Answering the question as asked, however, I would say: It might be that the warships could be built in the United States in a shorter period than they could be built abroad; our ship yards might not be so busy as foreign yards. Again, the prestige of the American navy since our war with Spain would unquestionably influence a foreign nation seeking its warships abroad.

"It is quite likely that we are able to build warships in the United States as cheaply as they are built abroad, but that by no means implies that we can build merchant ships as cheaply, and the fact is we cannot. The reason we build warships as cheaply is because the government declared, fourteen years ago, that all of the designs, material and workmanship on our warships should be American. Thus, confining the demand for our new navy to American ingenuity and skill, money was put into expensive plants, competition was engendered between our own people alone, with the result that in about ten years we were able to build warships approximately as cheaply as they can be built abroad. But a warship is a very different construction from a merchant ship. If a similar demand should be created for American merchant ships, covering a similar period, doubtless at the end of that time we would be building as cheaply here as elsewhere.

"The Savannah News further asks: 'Why is it that ships can be built in England or Germany cheaper than they can be built in this country, where all the material can be obtained at prices below those which prevail in Europe?'

"The materials cannot be purchased as cheaply here as in Europe. We are rapidly approaching the time when that will be true, but it is not true now. A year or more ago, just at the close of a long strike in Great Britain, during which British rolling mills had been shut down for months, and when they were working night and day in order to supply the accumulated demand, naturally prices soared, but even then it was impossible to promptly supply the home demand; at that same time the boom had not begun in steel manufacture in the United States, and for a short time, as a result, we shipped to Great Britain about 100,000 tons of ship building materials at prices slightly below British prices. But we are not doing so now, and have not for over a year. Prices of steel are very much higher in the United States now than they are in Great Britain, but as soon as the abnormal demand has been satisfied prices will doubtless fall to a normal rate.

"But it should be borne in mind that American ship builders are not dependent upon American steelmakers for their ship building materials, in the case at least of ships designed for the foreign trade, as such materials are admitted to the United States free of duties, and have been for several years. The materials entering into a first-class ship never represent more than 50 per cent. of the cost of the completed vessel, fully 50 per cent. representing labor in the ship yards. Another thing, in England, Scotland and Ireland, the constant demand for ships keeps the men steadily employed, and thus their maximum efficiency is utilized. The same is true in the modern German ship yards. Labor in those ship yards, however, receives but about half what is received in ours. In our yards the majority of the men have come from Great Britain; their efficiency in our yards is little, if any, greater than in foreign ship yards.

"The intermittent character of the employment in American ship yards does not permit of the efficiency and economy in construction possible in those countries where steady employment is assured. Take the case of the Clyde, for instance; there ships are duplicated over and over again, from the same designs and specifications; this has been going on for many years and it accounts for the celerity and the cheapness of their constructions, especially in that character of vessels—the slow-going, so-called "tramp" variety—in which changes in plans and specifications are unnecessary. This is not the case in the United States. There are new plans and new specifications for each different ship. I recall that one of the firm of William P. Clyde & Co. put out plans and specifications for a ship, and finally placed the order with the lowest bidder. After the order was placed the Clydes were informed by their builders that if they would duplicate the order a reduction of $10,000 per ship would be made; and had the order been quadrupled I have no doubt a reduction of $20,000 per ship would have been possible.

"The passage of the shipping bill is designed to cover all of these unfavorable conditions, and the belief is, especially among our ship owners and ship builders, that with the then probable reduction in the price of materials there will be an increased efficiency and economy in construction, due to a long sustained and steady demand for new ships, that will bring the price of their construction at the end of a decade or so as low as foreign prices.

"The editor of the Savannah News falls into an error that many other editors and laymen as well fall into, of making a comparison of the ability of our people to build locomotives, machinery and bridges here as cheaply, if not more cheaply, than they can be built elsewhere, with our ability to build ships. When we have had as much employment and as much experience, due to long and steady demand for ships in this country, as we have in bridge, or locomotive, or machinery making, then we shall reach the same position with regard to ship building that we have reached in bridges, locomotives and machinery.

"I think what I have just said answers the editor's inquiry as to 'Why is it that we are so far behind England and Germany in ship building, and so far ahead of them in everything else?' That 'everything else,' as I come to look at it, is rather sweeping and inaccurate. There are many other things which we are as yet unable to produce as cheaply as our foreign rivals.

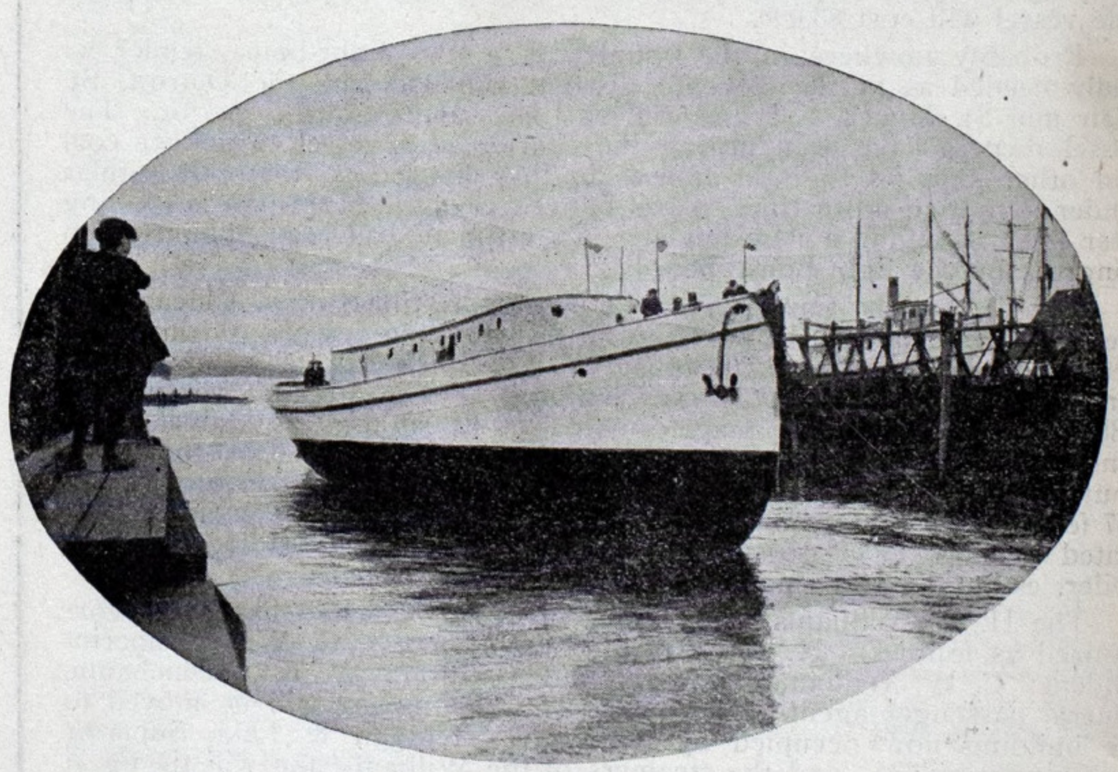
"What the editor of the Savannah News says about the efficiency of our merchant ships in the days of wood I cannot and shall not in the least gainsay. But then we had half a century of experience behind us; we had always built ships more cheaply than our rivals; we had men trained to the business, as were their fathers before them; we had neither cable nor steam in those days; Yankee skippers were the trading merchants as well; and in every way things were vastly different than they are now. Now we are out of the trade, and even on a footing of equality through government aid, the struggle is necessarily going to be fierce and prolonged before our ships will regain any large share of our foreign carrying. Meanwhile, transportation rates will inevitably fall, and our producers and exporters will be stimulated thereby to increase their foreign trade.

"The editor of the Savannah News ought to think for a moment, that if it were possible to build ships in this country even a trifle more cheaply than they can be built abroad, ship yards would be multiplying constantly. Capital is too plentiful in this country, skill is too abundant, ability is too general, and enterprise is too forward for this nation to be laggard in building merchant ships one moment beyond the time that they can be built at a profit. About 2,000,000 tons of new merchant ships are built each year for the world's foreign trade, and of these our average has not been more than 1 per cent., say 20,000 tons a year, during the past decade. The editor of the Savannah News does not for a moment imagine that the chance to share in this construction would not be availed of by our people if there were a profit in it?"

OCEAN-GOING STEEL TUG TATOOSH.

The Moran Bros. Co., Seattle, Wash., has just launched the ocean-going steel tug Tatoosh, built by them for the Puget Sound Tug Boat Co., Capt. J. B. Libby, manager. This tug is said to be the finest vessel of her class ever built on the Pacific coast. She was launched Feb. 22 and is of the following dimensions: Length, 128 feet; breadth, 25 feet; depth, 15 feet 3 inches. The vessel is of steel throughout, including full deck house.

The main engine is of the triple expansion condensing type with cylinders of 16, 24 and 40 inches diameter and a stroke of 28 inches. The estimated I. H. P. is 800. There are two main boilers, 11 feet in diameter by 10 feet in length, built for a working pressure of 150 pounds. The equipment of auxiliary machinery and all other appliances are in all respects suited to make the Tatoosh a first-class seagoing tug.



THE STEEL TUG TATOOSH, BUILT BY MORAN BROS. CO., SEATTLE, WASH.

Another vessel of the same type was launched by the Moran Bros. Co. on the same day as the Tatoosh and was christened Dolphin. This vessel is also of steel throughout, including deckhouse, and is of the following dimensions: Length, 80 feet; breadth, 17½ feet; depth 9 feet. The engines of this boat are of the compound type, with cylinders 10 and 20 inches diameter and a stroke of 16 inches, using steam at 150 pounds, supplied by one boiler 7½ feet in diameter and 9 feet long.

A NEW COMPETITOR FOR SHIP CONSTRUCTION.

Chamblin & Scott of Richmond, Va., submitted to the treasury department, a few days ago, a bid of $163,500 for the construction of a revenue cutter for the great lakes. John Chamblin and James H. Scott are the proprietors of the Richmond Iron Works and have not hitherto engaged in the ship building industry. Their plant is well equipped and is located on Shockoe creek. Information from Richmond is to the effect that there is not a sufficient depth of water at the works at present to launch a vessel of any size. It is quite probable, therefore, that were the contract secured, the company would move its plant to some more advantageous spot. The alternative would be to have the hull constructed elsewhere. The fact, however, that the company has submitted its bid is sufficient indication of its intention to eventually engage in ship building. It would not be the first concern to enlarge its works after receiving a large contract. The company's bid was the third from the lowest.

JAPANESE NAVY.

TONNAGE QUADRUPLED SINCE THE WAR WITH CHINA—EVERY TYPE OF VESSEL FROM THE MOST POWERFUL BATTLESHIP TO SOME OF THE FASTEST TORPEDO BOATS IN THE WORLD.

FROM THE KOBE CHRONICLE, JAPAN.

According to a lately-issued classification of the minister of marine, the Japanese navy consists of four first-class and two second-class battleships; four first-class, nine second-class and five third-class cruisers; ten coast-defence ships; seventeen gunboats; four dispatch vessels; one torpedo depot ship; eight torpedo destroyers, and a large number of torpedo boats. It may not be uninteresting to compare the present strength of the navy as set forth in the above list with its strength at the time of the war with China in 1894-5. Of course, everybody knows that during these hostilities Japan did not lose a single vessel, and that the whole of the fleet with which she managed to annihilate the sea power of China is still intact, and at her disposal. In 1894-5 she did not possess a single first-class battleship, and the Fuso kan, which now appears at the bottom of the list of second-class ones, is a battleship only by courtesy. In 1894 the Fuso was eighteen years old, and as thirteen knots were all that could be got out of her, she was a veritable lame duck at the battle of the Yalu. Since then, she has been at the bottom of the Inland sea, raised, and rejuvenated at Kure, and is now healthier than she ever was before. At the date of the Yalu, Japan had no first-class cruisers; her main strength then lay in the six second-class cruisers Yoshino, Itsukushima, Matsushima, Hashidate, Naniwa and Takachiho, of a tonnage ranging from 3,700 to 4,277 tons, and of a speed varying from 17 to 23 knots. In the course of the war, the Chilian Esmeralda was bought and added to the navy as the third-class cruiser, Idzumi-kan; but she was never in action. The results of the war added several Chinese vessels to the Japanese fleet, the principal of which were the Chin-yen of 7,400 tons and 13 knots, now ranking as one of Japan's two second-class battleships; the Sai-yen, as a very slow-footed third-class cruiser of 2,300 tons, and the still more laggard Ping-Yuen.

On looking at the navy list recently issued by the minister of marine, we have no difficulty in perceiving, almost at a glance, that the additions made to the naval strength of this country since the treaty of Shimonoseki would in a very short time make very short work of the fleets of both China and Japan combined as they stood in 1894. To begin with a comparatively insignificant item, the three new second-class cruisers lately added would serve to offset any four of the Japanese ships that fought at the Yalu. The Takasago of 4,160 tons, built on the Tyne, is fully equal to the Yoshino in speed, superior in protection, and much superior in armament. The Kasagi of 5,416 tons, built by the Cramps of Philadelphia, and the Chitose of 4,760 tons, built by the Union Iron Works of San Francisco, are larger vessels than any of the Japanese ships engaged at the Yalu, while their protection and armament are even better than the best of those, and their speed of 22 to 23 knots is some 4 or 5 knots ahead of every one of those ships, with the single exception of the Yoshino. Then, after these, we have four first-class armored cruisers of from 9,400 to 9,875 tons, and these alone could "eat up" the Japanese fleet of 1894, and, to use a phrase of Thucydides, "eat it up raw." Of these four as yet only two, the Asama and the Tokiwa (built on the Tyne), are in Japanese waters; the Yakumo being expected to leave Stettin in April and the Azuma to leave Rochefort some time in spring. Of these ships one of the greatest of living naval experts writes as follows:

"The Japanese Asama and her sisters are very fine vessels. The hull is well protected by a 7-inch to 3½-inch belt, and by 5 inches of armor on the side above the belt to the level of the main deck. No other cruiser is better protected than this. They possess a most powerful armament which is well distributed. In the opinion of the writer the Asama is the most effective type of cruiser now built or building." When it is said that their protection is of Harveyed steel, that their armament is nearly as powerful, that their speed of 22 knots and over is some 8 or 9 knots greater than that of the two Chinese battleships engaged at the Yalu, it will be recognized that these so-called first-class "cruisers" are really far superior to either of what are styled Japan's two "second-class battleships," the Chin-yen and the Fuso; and superior also to Russia's much-talked-about Rurik and Rossia and Gromoboi (building). These three vessels, ranging in tonnage from 10,923 to 12,336 tons are, it is true, a little larger than the new Japanese cruisers, but while not in any way superior in armament, they are inferior in speed, the swiftest being 2 knots behind the Japanese vessels, the Rurik being actually 4 behind, while all these three Russian ships labor under the vital disadvantage of having no protection for their batteries. All things considered, the Asama and the Tokiwa (now in Japanese waters) should be more than a match for the bigger Rurik and Rossia, now on Russia's far eastern naval station. And behind these, in the present navy list stand four first-class battleships that are among the most powerful and efficient war engines afloat. It is true that of these at present two only are in Japanese waters. But on Jan. 28 the third left England for Japan, while the fourth will in all likelihood leave the Clyde before summer sets in. The Fuji and the Yashima (already in Japan), of 12,450 and 12,146 tons respectively, are far more powerful than any Russian vessel at present in the far east. Neither the Navarin nor the Sissoi Veliky, nor even the Petropaulovsk would have much chance against either of them, for every one of these Russian ships would be outclassed in speed, in protection and in armament. Englishmen are not a little proud of their Royal Sovereign type; and the Fuji and Yashima are Royal Sovereigns with some improvements. But formidable as they are, the Fuji and the Yashima are by no means the most formidable items in the first line of Japan's national defense. The Shikishima, now on her way to Yokosuka, and the Asahi, soon to follow, are considerably more powerful than either of these. Both, exceeding some 15,000 tons, are improved Majestics, and saying so is equivalent to saying that they are the most efficient war-machines afloat under any flag in the world. Besides all these, Japan has yet two more first-class battleships—the Hatsuse at Elswick, and a still unnamed one at Barrow—building, which will be, if anything, still more powerful than the Shikishima and the Asahi, while, in addition to the four first-class cruisers of which we have spoken, the Idzumo (9,906 tons) and another unnamed one building in England will soon be added to the list.

In addition to the new battleships and cruisers Japan has been adding to her torpedo flotilla and providing herself with a fleet of torpedo boat destroyers, of which she had none in 1894. According to the latest official list Japan has at present eight of these torpedo boat destroyers; but, as a matter of fact, four or five more have either already arrived in her waters, or are on their way out from Europe. The naval expansion programme included over a score of these craft in all, four of which were to be built at Havre, four by Schichau at Elbing, half-a-dozen by the Messrs. Yarrow, and another half-dozen in Thornycroft's yard. They are all somewhere in the neighborhood of 300 tons, more or less, and most of them have done over 31 knots at their trials. Except the Turbinia type (which is still in a problematical state) these vessels are as swift as anything afloat. Those building at Elbing, if they develop their contract speed of 33 knots, will be very nearly twice as fast as the present Kobe-Tokyo so-called express train. Of torpedo boats there are thirteen building abroad and about half-a-score in this country, the ten-years' programme providing for in all twenty-three first-class, thirty-one second-class, and thirty-five third-class boats, with a torpedo transport of 6,750 tons. All this, of course, indicates not so much an addition to as a multiplication of the naval strength of the country. To put the matter in a clear light, it may be said that the Japanese navy in 1894 amounted to some 60,000 or 65,000 tons, and was composed of ships ranking from second-class cruisers downwards, with no torpedo boat destroyers at all; while before the end of the coming summer the tonnage of the fleet afloat in these waters will run up to between 210,000 and 220,000, including every kind of vessel from the most powerful line-of-battleship downwards, and —what is of the utmost importance—of a wonderful homogeneity as regards speed and offensive and defensive purposes generally. Furthermore, work is being pressed forward on the Hatsuse and the unnamed battleship building at Barrow, and these two between them foot up to another odd 30,000 of tonnage, while the Idzumo and her unnamed sister ship also building in England represent a good 18,000 tons more. By the beginning of 1901, the tonnage of the Japanese navy of 1894 will be fully quadrupled.

MR. T. W. LAWSON'S MAGNIFICENT YACHT, THE DREAMER.

Lewis Nixon, the ship builder of Elizabeth, N. J., has just completed the magnificent steam yacht Dreamer for Mr. T. W. Lawson, the millionaire business man of Boston. The yacht is a model of beauty and convenience and has a cruising radius of 5,000 miles without recoaling. Her general dimensions are: Hull of steel, divided into five watertight bulkheads, 178 feet 4 inches over all; 148 feet 6 inches on the waterline; molded beam, 23 feet; depth of hold, 13 feet; draught 10 feet 6 inches. The motive power consists of a triple expansion engine, built by John W. Sullivan of New York. The cylinders are 14, 22 and 36 inches in diameter and 24 inches stroke. Steam is furnished by two Almy water tube boilers, built by the Almy Water Tube Boiler Co. at Providence, R. I. A feature of the machinery equipment is the simplex air pump, size 6 by 4 by 8 inches, designed by Mr. F. M. Wheeler of the Geo. F. Blake Mfg. Co. Every possible modern improvement has been included in the vessel's outfit. The ice machine is of the Roelker patent and make. The steam steering apparatus is from the works of Williamson Bros., Philadelphia. The ash ejector is of the Davidson patent. The windlass is supplied by the Hyde Windlass Co. of Bath, Me. The naphtha launch is from the works of the Gas Engine & Power Co., Morris Heights, N. Y. The electric and oil lamps were made by William P. Porter & Sons, No. 271 Pearl street, N. Y. The forced draft is the Kafe system of closed ash pan. Russell-See side lights are used. Two stockless anchors are of the Baldt type.

GETTING BACK AT AN EDITOR.

Editor Marine Review:—The following article, not altogether complimentary to the board of supervising inspectors of steam vessels, appeared in the editorial columns of the Marine Record of the 8th inst.:

"Oh, but that ubiquitous board of supervising inspectors of steamboats put their feet into it everywhere. At the last annual meeting, held a few weeks ago in Washington, they revised an amended amendment, and made themselves, also the secretary of the treasury, say port when they meant starboard, or vice versa, it matters little which. Then they revised the code of signals between the master and engineer in accordance with the suggestion of a Cleveland vessel manager, but they revised it so as to leave out the checking signal altogether. It was also understood that lake barges of 700 tons and over carrying canvas did not need a licensed master, but the examination has been put to a couple of them. One of the brilliant constellation of talent, yclept, the United States board of supervising inspectors of steamboats, ordered his local inspectors to convey to another periodical information that the Marine Record had written for and worked up, thus turning his locals, pro tem, into reporters. Then these little matters are laughed off with that idiocy of ignorance as if to the manor born. A wonderful bureau, truly! ! !"

The editor speaks of the board as "ubiquitous" and "yclept," and also refers to one of its members as being afflicted with idiocy. I confess that I was obliged to appeal to an unabridged dictionary to ascertain just what kind of a board was made up from the supervisors. Had the editor been contented with calling the writer just a common idiot it could have been endured, but being "ubiquitous," "yclept" as well, is indeed strong language. However, the editor being given to the use of such words, and ofttimes sprinkling in a little Latin by way of informing marine readers that his superiority in the line of education can scarcely be brought within their scope of comprehension, I am very glad to find in a marine journal such unmistakable signs of culture, tending to uplift all things marine to a higher plane of scholarship, far more commendable and useful to the mariner than life saving appliances.

I hardly think I would be justified in speaking of the editor as being idiotic. Having conversed with him on occasions when his mind was in its normal condition, I am quite sure I detected traces of intelligence in his conversation, though I scarcely expected such evidence to emanate from the same brain that dictated this criticism. However, the influence of "ubiquitous," "yclept" and idiocy may have impaired my judgment to such an extent that I may be mistaken as to seeing any such traces of intelligence, and a further acquaintance with the editor may prove that I was certainly mistaken.

JAMES STONE.

Cleveland, March 14, 1900.

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Scholarly, gentlemenly and level headed is the Hon. John D. Long, secretary of the navy. During the past week an agitation has been started in various parts of the country in favor of the construction of battleships and cruisers at the navy yards. It received its greatest emphasis from the Brooklyn navy yard and it traveled rapidly to Washington to trouble the house naval committee. Secretary Long very sensibly told the committee that the government was only justified, once in a while, in building a battleship at a government yard to act as a stimulus to private enterprise, but that it was not justified in becoming an active competitor of legitimate private business. He was frank enough to say that statistics showed that it took twice as long and cost twice as much to construct warships at navy yards than it did at private yards. He exposed the fallacy that ships should be built at navy yards to give employment to labor. It would not increase the general employment at all, for if the labor is not employed in the yards it will be employed outside.

"I fear," said Secretary Long, "that there is danger of a navy yard becoming a factor in politics if the number of employes is so largely increased as it would be if ship building were added to repairing. If we build a ship at New York we must build one at Norfolk and there will be pressure to build one at Boston and one at Mare Island and one at Philadelphia and one at Port Royal and Key West and Portsmouth. If you start a ship at one of these places you must employ a great many men, and as soon as it is finished all these must be discharged and then there is more trouble. On the other hand in the business of repairing ships there is regular, steady employment. I really think it is a great deal better in the interest of labor as it is."

The members of the committee will do well to follow the advice of the secretary and let the government be only at the most an occasional competitor of the ship yards.

The house committee on merchant marine has ordered a favorable report on the shipping bill, and Gen. Grosvenor, chairman of the committee, is now preparing it for presentation to the house. The amendments which were made to the text of the bill, as already published in the Review, are unimportant. They simply re-enact provisions of existing law and were included at the request of Representative Minor. One of them, an anti-trust amendment, provides "that any vessel, or owner of a vessel, entering a trust to increase the price of export freight, or in restraint of export trade, shall cease to draw compensation under this bill." That is precisely the same as in existing law. Another amendment declares illegal "any combination or conspiracy of ship yards engaged for building vessels for compensation under this act, and upon proof of such combination or conspiracy of ship yards having a capacity of one-third of the new tonnage of the United States the secretary of the treasury is authorized to admit foreign-built vessels to take the place of new vessels constructed under this act, except that such new vessels shall not enter the coastwise or lake trade." The amendment to exclude tank ships that carry oil from receiving any compensation under the act was adopted, which effectually disposes of the falsehood that the Standard Oil Co. is interested in the bill. The tank ships were already excluded as they a e not suitable for carrying the mails or acting as transports.

As far as anything practical is concerned the armor plate controversy is exactly as it was two weeks ago, except that some important contributions have been made to its literature. It has been announced that the house committee on naval affairs would recommend the establishment of a factory for the making of armor plate if private concerns did not agree to furnish it for less than $545 per ton. Whatever the legislative end may do the executive department is irreconcilably opposed to the establishment of an armor plate factory by the government. The reasons set forth are sound and sufficient. The manufacture of armor plate by the government would be more costly than its purchase from private parties. The initial expense would be enormous, to which would have to be added the annual expense of maintenance and repair. The plant would have to be in continuous operation and exerted to its maximum capacity in order to prorate the cost per ton to a reasonable figure. Moreover, there already exists two fully equipped plants for the manufacture of armor plate in the country—plants which through perfect organization have reached a high degree of efficiency and with which, from the standpoint of economy, it would be impossible to compete. Commercially and politically considered the establishment of an armor plate plant by the government would be disastrous.

Secretary Long is evidently opposed to the radical reorganization of the revenue cutter service. In returning to the senate the bill providing for certain changes in the service he supports the Chandler amendment providing that even where a revenue cutter officer is senior to a naval officer with whom his vessel may happen to fall in, the naval officer shall rank the revenue cutter officer. He also pleads against what he calls a multiplication of navies, and urges that the revenue cutter service, the army transport service and the coast survey be placed under the control of the secretary of the navy.

Since the practicability of wireless telegraphy has been demonstrated an added value has been given to the captive balloon for purposes of warfare. The English navy is about to equip a few of its warships with balloons. As a matter of distance the balloon cannot fail to yield important results. It has been found difficult to compass a great distance with the transmitter at the masthead. It is obvious that there can practically be no limit to distance with the employment of balloons.

The question of sheathing the battleships is still an open one with the naval board of construction. Com. Woodward, who superintended the construction of the Albany in England, has supported the contention of Rear Admiral Hichborn that foreign powers are in favor of sheathing their ships. The Albany is sheathed and various English and German firms are using sheathing. When the naval board makes its reply to Admiral Hichborn's statement, Secretary Long will transmit the entire correspondence to congress.

WASHINGTON NEWS NOTES.

Secretary Gage transmitted to congress this week the request of the light-house board for an appropriation of $60,000 for the construction of an iron light-house tender, 100 feet long and 6 feet draught, for service in St. Mary's river.

Representative Fitzgerald has introduced a bill directing the secretary of the navy to have a report compiled on the building of war ships in the yards of foreign governments and also the cost and names of vessels built in the United States navy yards during the past twenty years.

Senator Penrose has introduced a bill in the senate to increase the efficiency of the navy by the addition of a specially designed cruiser to be built and constructed with Painton's electrical system of multiple screw propellors. The bill has been referred to the committee on naval affairs.

Senator Frye has introduced two bills of interest to navigation—one to fix the compensation of surfmen employed in the life saving service and the other to limit the length and width of tows in the great lakes.

The navy department announces that the naval militia annual cruise will begin this year at New Orleans on April 23 and will extend up the coast for the different states until some time in October, giving each state seven days' actual practice at sea. The states in their order will be Louisiana, Florida, Georgia, District of Columbia, Pennsylvania, New Jersey, New York, Rhode Island, Connecticut, Massachusetts and Maine.

Secretary Long and the house naval committee visited Newport News on the gunboat Dolphin on Saturday last and inspected the battleship Kearsarge. The Kearsarge fired a salute of seventeen guns at the approach of the Dolphin. The committee expressed satisfaction at the excellence of the big ship's construction.

The senate committee on naval affairs has voted unanimously to report favorably a bill looking to the construction by the government of a cable to the Philippines. The measure, which will be drawn up by Chairman Hale, will make an appropriation for a cable between San Francisco and the Hawaiian islands only, to be laid under the direction of the navy department. The amount of the appropriation has not yet been fixed. It is proposed to extend the cable to the Philippine islands in the near future.

Representative Boutell of Illinois has introduced a bill in the house of representatives that whenever the death or injury of a person shall be caused by the neglect or default of any ship or navigation company through its employes, action shall be brought against the ship or navigation company.

The secretary of war has transmitted to the house a statement from Brig. Gen. John M. Wilson, chief of engineers, U. S. A., giving the name and place of residence of each civilian engineer employed between July 1, 1898, and June 30, 1899, on work for the improvement of rivers and harbors. The statement also gives location of work, time of employment and compensation paid. It shows that 147 civilian engineers were employed, at a compensation ranging from $90 to $300 a month.

NAVAL MATTERS.

Secretary Long is now considering what shall be done with the Boston. Rear Admirals Hichborn and O'Neil recommend that only such repairs be made as will keep the Boston in good condition for ten years at an expense of about $350,000. The majority of the board favors fitting the vessel with twin screws, new engines and boilers and having her practically rebuilt at a cost of $700,000.

Rear Admiral Farquhar, commanding the North Atlantic squadron, will arrange the program of the summer cruise of that squadron along the New England coast so that the squadron may participate in the celebration of the 125th anniversary of the battle of Bunker Hill. This arrangement has been made at the request of the city officials of Boston. The New York, being in need of repairs, the Kearsarge will replace her as flagship.

The navy department has paid Benjamin Hall, of Portsmouth, R. I., $32,000 for seventy-five acres of land on Narragansett Bay, to be used as a coaling station. It is intimated that a naval dry dock with a repair plant may be located at the same place. On this point the department has not as yet definitely decided. The board which recommended the site consisted of Capt. H. C. Taylor, Com. N. E. Mason and Lt. Com. Herbert Wilson.

Secretary Long has taken no action as yet on the request of the treasury department for the evacuation of Dry Tortugas. Surgeon General Wyman recommends the discontinuance of all naval work there during the season of close quarantine from April 1 to Nov. 1.

Owing to a slight accident to the Marblehead, she has been ordered to Mare island for repairs and will not go to Central America. The Philadelphia has been ordered to Santa Barbara and will go to Central America in her place.

A recent report from the U. S. S. Iowa indicates that she is in good condition for sea service and needs but little repair.

The Charlestown navy yard has received orders to make all the anchors and chains as well as all the rope necessary for rigging the six new cruisers of the Chattanooga type, which means three 6,000-pound and one 3,500-pound anchors, besides two kedges and half a mile of chain for each vessel.

The board of officers of which Capt. Henry C. Taylor, U. S. N., is president, convened to select a site for the naval magazine near New York city, in its report to the navy department, has recommended that Iona island, in the Hudson river, be acquired by the government for this purpose.

AMONG ATLANTIC COAST BUILDERS.

NEW WORK AND PROGRESS OF WORK AT THE VARIOUS SHIP YARDS — LAUNCHES, TRIAL TRIPS, ETC.

A big repair job which the Cramp company has on hand is that of the Hamburg-American liner Brisgavia, which returned to port last week leaking as the result of striking a sunken obstruction. Because of her length, 450 feet, she is to be dry docked at the League Island navy yard, and she will be the first merchantman permitted to use that basin it is stated since 1894. The steamer Restormel (Br.), hence for Sligo, which struck a rock some days ago, has been floated out of Cramp's dry dock fully repaired. Morro Castle is to be the name of the big steel steamer that is expected to be launched before the end of this month from the Cramp yard for the New York & Cuba Mail Steamship Co. (Ward line). This is the craft that this company bought from the Plant concern shortly after work had been begun on her. Two other steamers are to be built at Cramp's for the Ward line.

Existing contracts with the Bath Iron Works of Bath, Me., aggregate $3,000,000 and will keep their present force of 1,000 men busy for two years to fill them should no other contracts be taken. The plant of the company has been much enlarged during the past year. A new machine shop 310 by 100, has been built; also a joiner, carpenter and pattern shop, 220 by 60 feet and two stories in height. The yard has been increased to nearly double its former size. The monitor Connecticut will be launched from this ship yard next month and then the keel of the cruiser Cleveland will be laid. The contract price for the cruiser is $1,041,650. The company is also building the torpedo boats Bagley, Barney and Biddle.

Capt. John G. Crowley of Taunton, Mass., who has a fleet of schooners engaged in the coal trade between Philadelphia and New England, has announced his intention to have constructed a seven-masted schooner that will carry 6,500 tons of coal. The contract has not yet been placed. H. M. Bean of Camden, Me., is now building a six-masted schooner for Mr. Crowley. About a year ago Mr. Crowley caused the five-masted schooner John B. Prescott to be built. Mr. Crowley argues that it costs no more to operate a seven-masted schooner than a five-masted one, and that therefore there is a greater percentage of profit in the larger vessel.

The schooner Wellfleet has just been launched from the ship yard of Cobb, Butler & Co. at Rockland, Me. Her dimensions are: Length of keel, 148 feet; breadth of beam, 35 feet; depth of hold, 14 feet. The firm of Cobb, Butler & Co. is gaining a reputation for excellent workmanship. Another vessel to be built by this company will be of 160 feet keel, 36 feet beam and 17 feet depth.

The New Haven Steamboat Co., owners of the Narragansett line, have decided to contract for the building of a twin-screw passenger steamer of the same general design as that of the Richard Peck and Chester W. Chapin. The estimated cost of the steamer is $500,000. It is the intention to put it on the line between New York and Providence, R. I.

Two torpedo boats, McDonough and Lawrence, which by contract are to have a speed of 34 knots, are to be launched at the Fore River Co.'s works at Weymouth, Mass., in April and are already attracting much attention. Their dimensions are 242 feet long, 22 feet beam and 6 feet draught, with engines of 8,400 horse power.

The cruiser Variag, which is being finished at Cramp's for the Russian government, will be given a builder's trial early next month. Her official trial will be unusually interesting, as she is to undergo the strain of having her guns fired while it is being held. It is expected that she will be the finest cruiser in the Russian navy.

It is understood that the New York Ship Building Co., which is establishing extensive works at Camden, N. J., will bid on the next naval order of the United States government. It is expected that the company will begin the actual work of ship construction on May 1. It already has plans in preparation for a large steamer.

David Clark of Kennebunkport, Me., has just laid the keel of a ferry-boat for the Portsmouth, Kittery & York Electric Railroad Co. The boat will be a double-ender of the side-wheel type to ply between Portsmouth, N. H., and Kittery, Maine. Mr. Clark is also building a coal barge for Langley & Son of Portsmouth.

The new five-masted schooner Helen W. Martin was launched from Percy & Small's ship yard in Bath, Me., last week. Her dimensions are: Length, 281.6 feet; breadth, 44.8 feet; depth, 20.9 feet; gross tonnage, 2,265.12; net tonnage, 2,020.86. She was built for the general coasting and foreign carrying trade.

The Burlee Dry Dock Co., Port Richmond, S. I., will build a steam lighter for the Standard Oil Co. and two steel steam barges for the New York Central Lighterage Co. Work is progressing favorably on the three new steel tugboats for the Lehigh Valley Transportation Co.

It is quite probable that the bid of $32,000, submitted by Edward J. Howard of Jeffersonville, Ind., to the government engineer at Rockland, Ill., for the construction of a side-wheeler to take the place of the Gen. Barnard on the Mississippi, will be accepted.

J. Warren Coulston, assignee, announces that on March 22 the entire plant of the Charles Hillman Ship & Engine Building Co. of Philadelphia, will be disposed of at public sale.

The submarine boat Plunger has finally been transferred to the William R. Trigg Co. of Richmond, Va., to have her steam machinery removed.

A five-masted schooner building at Camden, Me., for Capt. Geo. Bailey, of Manasquan, N. J., will be named the Malcolm Baxter.

The Merchants and Miners' steamer Gloucester will undergo a three weeks overhauling at the works of the Maryland Steel Co.

A report is current that Arthur Sewall & Co., of Bath, Me., are negotiating for ship yard property at Wiscasset.

Washburn Bros and Dunn & Elliott, both of Thomaston, Me., have in contemplation the construction of two schooners each.

G. A. Gilchrist and E. S. Carter, both of Belfast, Me., are to construct a three-masted schooner each this season.

I. L. Snow & Co. of Rockland, Me., will build a three-masted schooner this season.

George L. Welt of Waldoboro, Me., will build a five-masted schooner this season.

CHANGES IN THE NAVY.

Rear Admiral Louis Kempff, commandant of the Mare Island Navy Yard, signified by telegraph on Tuesday of this week his willingness to accept the assignment of second in command of the Asiatic naval station. Rear Admiral John C. Watson, recently ordered detached from the command of the Asiatic station, will be appointed commandant of the Mare Island yard on his return to the United States, another officer being assigned to the place meanwhile. Capt. C. S. Cotton, who will become a Rear Admiral on March 26, has been detached from the command of the receiving ship Independence at Mare Island and ordered to proceed home and wait orders. Capt. W. H. Whiting has been transferred from the duties of captain of the Mare Island yard to the command of the Independence. He will be succeeded as captain of the yard by Capt. Merrill Miller, whose orders were mailed Tuesday.

Rear Admiral Alexander H. McCormick, the commandant of the Washington Navy Yard, will be placed on the retired list of the navy on March 26 in accordance with his application. The order for his retirement was announced today. In consequence of Admiral McCormick's retirement and the promotion of Capt. Cotton, Commander Henry W. Lyon of the New York navy yard will become a captain. He was examined at the Washington navy yard this week. Commander Washburn Maynard will become a captain through the retirement of Capt. George M. Boek.

Lieut. Com. J. C. Gillmore, who was rescued from the Filipinos after being eight months a prisoner, and who returned to San Francisco on the naval transport Solace, has been detached from that vessel at Mare Island and ordered to proceed home. Lieut. Com. C. E. Vreeland, Lieuts. M. H. Signor, W. K. Harrison, L. A. Bostwick, L. A. Kaiser, L. R. De Steiguer, H. Gates, W. W. Buchanan, J. G. Quinby, W. B. V. Bronaugh and A. W. Dodd have been detached from the Solace and ordered home. Lieut. Coms. R. H. Galt and J. A. Shearman, Lieuts. W. A. Gilland, M. C. Gorgas and Paymaster Z. W. Reynolds, who were invalided home from the Philippines, have been ordered transferred from the Solace to the Mare Island hospital for treatment.

THE NAVAL APPROPRIATION BILL.

Although no formal action has been taken by the house committee on naval affairs in the matter of new ships, it has been practically agreed as foreshadowed in the Review last week that the coming naval appropriation bill shall provide for two battleships, six armored cruisers and four gunboats. The secretary of the navy asked for twelve gunboats, but as sixteen gunboats had been purchased from the Spaniards in the Philippines and as the secretary wanted gunboats for Philippine service it is believed the Spanish boats will answer all purposes. No request was made for new battleships, but as the European countries are strengthening their navies the committee believes the United States should keep pace with them.

The item for the battleships was agreed upon largely as the result of Admiral Dewey's representation before the committee, which in effect was that he believed one battleship was of more service than a dozen gunboats.

ITEMS OF GENERAL INTEREST.

The plans for the improvements in the Red River, about fifteen miles from Winnipeg, call for a dam across the Red River 800 feet in length, a canal 1,900 feet in length, one set of locks 215 feet in length, and dredging in the river for a distance of some 400 feet. The lock will be 215 feet long, 45 feet broad and the solid concrete will be 38 feet deep, giving the locks a high water depth of 30 feet, while at low water the depth will be 11 feet. The gates of the lock will be of steel. The approach to the locks will be by a canal from a point on the west bank of the river, a distance of 1,500 feet. The canal will be 100 feet wide, and have a depth of 11 feet. The distance to the canal from the river will be of partly wooden crib work, filled in with stone and will be 290 feet in length. The canal extends 400 feet north of the lock to the river, which will be dredged to a depth of nine feet for about 100 yards.

The announcement that Samuel Mather, H. G. Dalton and other members of the firm of Pickands, Mather & Co. of Cleveland have applied to the Canadian government for a charter to build a railway from Michipicoten, Ont., to their mines ten miles distant, means that they are probably determined upon going ahead with the development of iron mining property in the Michipicoten district, which is about 60 miles above the Sault on the Canadian shore of Lake Superior.

Representatives of lake vessel interests who have been looking after the Sault power canal project say that the bill presented in congress by the power canal company through Congressman Sheldon might as well never have been prepared as far as protection to the shipping interests is concerned. It is understood that the members of the rivers and harbors committee are being informed of the kind of measure which the vessel owners would regard of sufficient protection to navigation.

The secretary of the navy has appointed a board to arrange for the establishment of the proposed naval station at Pearl harbor, Hawaii. The board consists of Rear Admiral A. S. Barker, commandant of the Norfolk navy yard; Capt. Henry C. Taylor, commanding the receiving ship Vermont; Commander C. C. Todd, chief hydrographer, and Civil Engineer H. H. Rouseau, with Lieutenant F. L. Chapin as recorder.

An item was published in the eastern press a few days ago to the effect that the Cramps intended to construct a ship yard in Ontario at Collingwood on the Georgian bay, and had agreed to expend $600,000 on the plant. Secretary Charles Taylor of the company says that "the report is utterly and absolutely without a shadow of foundation in fact and we are unable to surmise its origin or the purpose of its authors."

STEERING BY ETHER WAVES.

A TEST OF WIRELESS TELEGRAPHY APPLIED TO TORPEDOES—TRYING TO SOLVE ANOTHER PROBLEM OF MODERN NAVAL WARFARE.

Cecil Varicas of London, England, believes he has solved one of the problems of modern naval warfare. As described in the patent granted to him first by the British government and later by the governments of the United States and other countries, his invention is a contrivance for electrically "controlling from a distance the steering gear of ships, torpedoes and other floating bodies." If the invention is successful it will be possible not only to hit the mark nine times in ten with a torpedo but also to do this without the risk of human life now incident to the use of torpedoes in actual war. The contrivance is a development of wireless telegraphy.

Varicas made no experiments of consequence until after his patents had been granted, and the first test to be witnessed by officials on behalf of any government was made the other day at Geovil in Somersetshire in presence of Commander Colwell, United States naval attache at London. The test was also witnessed by A. C. Higgs, consular agent for the United States at Weymouth. Like various earlier private tests, it was made with a small, specially-built launch, and in order to insure smooth water the launch was floated in the public bath at Geovil instead of in the sea at Weymouth near by. The pool at the Geovil bath is about 100 yards long and 30 yards wide. At one end was set up a transmitting apparatus such as is used in wireless telegraphy. At the other end was the launch, 42 by 7½ inches, which was propelled at a speed of about 4 knots by an electric motor deriving its power from small cells. The launch contained a primitive receiver, capable of working an ordinary Morse writer at a distance of a hundred yards. A short wire projected from the mast. In the launch the Morse writer was replaced by a rudder-turning contrivance. A spring attached to the rudder held it, normally, hard a'starboard. After close inspection of the launch and instrument ashore, Mr. Higgs turned on the motor in the launch, and it went scudding along turning naturally to port. Commander Colwell stood by the transmitter. Young Varicas was beside him, clutching the handle of a wheel attached to the instrument.

"First of all," said Colwell, "make it come straight up the pool." Buzz went the wheel, and quickly the launch forsook its port course and came straight as a die toward the inventor.

"Send her down again," said Colwell, "and I'll give you the directions. Port," he continued, as if talking to the man at the wheel. Round went the inventor's hand, and the launch turned until she almost rammed her bow against the starboard side of the baths. "Starboad," said the commander, and before the launch had reached the end of the pool she was knocking her nose against the port walls. She had answered her helm as if there had been a man aboard of her to carry out the orders of the commander, yet the only connection she had with the shore was the wireless wave that shot from the transmitter, ran down her mast and brought her rudder into position.

By the wheel attached to the transmitter the operator or steersman moves to the right or left two conductors which traverse the surface of a drum, which is kept revolving by clockwork. The surface of this drum consists half of carbon and half of copper. The division is made not sharply in the middle, but in zigzags. Thus, as this drum revolves, the condition of the current depends upon the position of the conductors controlled by the steersman's hand. If he turns the wheel so that the conductors are in the middle of the drum, the current is broken evenly, the conductors touching carbon and copper, as they revolve under them, in equal proportion. This results in making the boat keep a straight course. If, on the other hand, the wheel sends the conductors almost entirely upon the carbon section of the drum, the longer resulting breaks in the current send the boat to port, and vice versa when the conductors are chiefly passing over copper. In other words the boat is steered according to the duration of the breaks in the wireless current. This sounds complicated, though it is a literal report of the inventor's attempt to put it plainly in lay language, and in practice it is so easy to understand that a child could work the apparatus, for all that has to be done is to turn the wheel one way and the boat follows the hand. The technical name of the wheel is the "periodic interrupter," and its functions as technically described are "to give periodic interruptions corresponding to the periodic oscillations of the rudder, the successive periods of oscillations being so made and varied that the boat can be steered in any curve or in a straight line."

Commander Colwell tested the contrivance with care. The little launch was sent up and down the bath, turning and swerving at the word of command. A small stick was thrown into the water and the order was to bring the launch from the opposite end and hit the stick. This manœuvre was successfully performed. The wire at the masthead was taken down, and the same performance gone through. The inventor says that the distance at which control may be exercised depends only upon the power provided ashore. The great drawback of the test was the utter unsuitability of the model to submerged trials. As it was an open launch these were impossible, but the inventor maintained that the apparatus had been found on experiment to work as well under water as on the surface. From a government or practical point of view, however, further trials in the presence of experts will have to take place before this most important point can be settled.

The difficulty that is the hardest to overcome in ether wave steering of this kind is what wireless telegraph experts call "jamming." Anyone can produce ether waves by means of an ordinary induction coil, a contact breaker and small battery power in circuit. The question, then, that naturally suggests itself is, "Will not the ether wave detecting apparatus in the steering gear of the torpedo or boat be sensitive to any ether waves in its vicinity?" and there the inventors halt for an answer. What is lacking is tuned receivers, and there is not room for these in the small space allowed in a torpedo. If the ship toward which a torpedo is to be steered by ether waves has on board an induction coil in battery circuit—which can be made to work automatically—no ether steered torpedo can reach its mark. It would be as useless as a wooden buoy. Another induction coil working within range of sensibility of the detector will completely jam the receiver. Furthermore, no inventor has succeeded in sending ether waves of this kind through more than a foot of water. What does this mean to the torpedo steerers? The torpedo must either float on the surface of the water or haye a conducting connection from its depth in the water to the surface above. But in both cases the possibility of "jamming" would be the same.—New York Sun.

BRITISH NAVAL PROGRAM.

Singularly concise and clear is Mr. Goshen's explanation of the naval estimate just submitted to the British parliament. The British program cannot be stated in better language than his own.

"To sum up the substance of the estimates is that our expenditure is to be £27,000,000 and our personnel is to be 115,000 men; including our naval reserves it is to be 150,000 men. In the dockyards there are to be 32,000 men. The expenditure on ships is to be £8,460,000. We are to lay down two battleships and six armored cruisers, besides other smaller vessels, bringing the total number of ships which will be under construction, or passing through construction, in the coming financial year to seventeen battleships, twenty armored chuisers, four protected cruisers, twenty-one destroyers and other small ships."

Considering the enormous programs of Germany and France some surprise might be expressed over the comparative modesty of the British estimate. But as Mr. Goshen says it is useless to lay down new ships while the material for those under construction cannot be obtained. He says that it would be distinctly dishonest to suggest to undertake building and to ask parliament to vote money for ships which cannot possibly be constructed within the time. There is yet unspent from the last estimate the sum of £1,400,000, the contractors being unable to earn it. The present program is therefore based upon what the admiralty believes to be the output of the country in armor, hulls and machinery and in the vast number of accessories to be provided. As it is, the present program of seventeen battleships, twenty armored cruisers, four protected cruisers and twenty-one destroyers would overtax the capacity of any other nation.

NEW CONTRACTS AT WILMINGTON.

Wilmington, Del., March 13—The Harlan & Hollingsworth Co. has just contracted with C. M. Mallory & Co. representing the New York & Texas Steamship Co. for a sea-going freight and passenger steamer, the first of three such ships. The vessel will be one of the largest ever built for the coastwise trade and the largest ever built at the Wilmington company's yards, being about 400 feet long. She is to be a 16-knot ship for the route between New York, New Orleans and Galveston.

The Harlan & Hollingsworth Co. has also contracted for six large steel ocean-going barges instead of three as recently stated. These are for the Rockland-Rockport Lime Co. and will be used for carrying lime between Maine ports and Boston. It is the intention, probably, to build two of these barges on each set of ways, thus leaving room for other large operations, and arrangements have been made with Pusey & Jones Co. to build two of them, in order to retain the work in Wilmington.

The steamship Indian of the Winsor line is expected here this month to be docked and lengthened 40 feet, and the steamer Grecian of the same line will probably be delivered very shortly, as well as the steamer Chesapeake for the New York & Baltimore Trans. Co., recently launched.

The Harlan & Hollingsworth Co. has also contracted with Mr. Chas. Fletcher, a prominent manufacturer of Providence, R. I., for a 212-foot twin-screw steam yacht to be finished early in 1901 and to be built under the supervision of Mr. A. S. Chesebrough, the designer.

STEEL CASTING CO.—STRONG ORGANIZATION.

An application has been made for a charter for the Seaboard Steel Casting Co., with a capitalization of $500,000. A tract has been purchased on the river front, in the city of Chester, Pa. The property is about 900x700 feet. These dimensions will be extended by dumping of refuse and material from excavations into the river. Both the Pennsylvania and the Philadelphia & Reading railways pass the property, and will be available for shipping. The ground at this point is hard gravel, doing away with the necessity of piling for foundations. The company will build a large foundry, 560 feet in length, containing two open hearth furnaces of 20 tons capacity each, and with the most modern appliances. A machine shop of large size will also be built to finish castings for parties desiring it. The president of the company will be William C. Sproul, who was until recently vice-president of the Roach Ship Yard, and the general superintendent will be Mirabeau Sims, who was for a long time with the Penn Steel Casting & Machine Co., and has latterly been foundry superintendent for the General Electric Co. at Lynn, Mass., and for the Sargent works at New Haven, Conn. It is understood that a number of very prominent ship building, railroad and machine building people are interested in the new Seaboard company. Mr. Sims is a son-in-law of Frederick Baldt, and served a long apprenticeship under him at the American and Penn steel casting plants.

CHARLES H. CRAMP ON THE RECENT RUSSIAN LOAN.

Referring to the loan recently negotiated by the Russian government in New York for $25,000,000, Mr. Charles H. Cramp, president of the Wm. Cramp & Sons Co., said:

"While I cannot say exactly to what extent Russia has placed orders in the United States, I venture the opinion that this $25,000,000 will not pay all the obligations that she has contracted in this country during the past two years for rails, Westinghouse air brakes, ships, large tools and appliances. She is getting ready to be a large purchaser of coal. While as yet rails are practically the extent of her purchases in the steel line, I think that she will buy extensively of this material when the mills can accommodate her. Russia is sure to be a great field for American output."

The William R. Trigg Co. of Richmond, Va., is constructing a missionary boat for Africa. She will be about 100 feet long and will have side-wheel engines. She will be taken apart and shipped to her destination in sections. Work is proceeding satisfactorily at this ship yard on the torpedo boats Stockton and Shubrick and the torpedo boat destroyers Dale and Decatur.

ADVERTISING TACKLE BLOCKS.

Sentiment and business are often thought to be mutually exclusive, yet there are times when such does not seem to be the case. Witness an allegorical representation of the leading points of merit in the tackle

STRENGTH, DURABILITY AND LIGHTNESS COMBINED IN THE CLEVELAND BLOCK.

blocks made by the Cleveland Block Co., and sold by the Upson-Walton Co. of Cleveland.

"Seeing is believing," and no one can take even a momentary glance at the clever illustration reproduced above without carrying away a definite impression of the block company's claim.

VANDUZEN'S BARGE AND BILGE PUMP.

This valuable pump is made in six sizes. They are strong, economical and the most reliable and durable steam-jet pump made for steamboats, barges, ferry boats, launches, wrecking steamers, docks, etc. For full particulars, prices, etc., write for catalogue No. 82 to the E. W. Vanduzen Co., Cincinnati.

Wm. R. Osborn, who has had a ship yard at Peekskill, N. Y., for over forty years, has purchased property at Croton-on-the-Hudson, seven miles below Peekskill, and has removed his shops to that point. At present he is building a 70-foot passenger and freight steamer for Cuban parties. She will have twin screws. He also has on the stocks a 70-foot twin-screw houseboat. A dozen gasoline launch hulls, from 18 to 25 feet, are in course of construction, as is a rowboat for the use of the government at West Point.

NOTES OF GENERAL INTEREST.

England builds battleships complete, with guns and all, for $360 per ton of displacement. France pays $450 per ton, and Russia's new ships cost about $500 per ton.

Steel, as a ship building material, was used in the United Kingdom during the past year to the extent of 98.8 per cent. The amount of iron used was only 1.1 per cent.

The order for engines to be used by the Havana Dry Dock Co., in connection with the large dry dock to be installed at Havana, Cuba, has been placed with Houston, Stanwood & Gamble of Cincinnati.

The Chesapeake & Ohio coal agency has chartered five vessels and is chartering others to carry New River coal from Newport News to foreign countries. Cargoes are now under way to Barcelona, Spain, and to Vera Cruz, Mexico. It is the opening of a most important industry.

France is still building sailing vessels in large numbers. During 1899 the sailing ship tonnage launched by French ship builders amounted to 61,000 tons, including twenty-four vessels of 2,000 tons and upward. The largest are the Ville de Mulhouse and Ville de Havre of 3,214 tons each, built at Havre.

The Cuban Transportation Co. was recently incorporated at Mobile, Ala., with the following officers; Noel E. Turner, president; W. C. Taylor, vice-president; W. K. Syson, secretary and treasurer; George C. Southard, manager. The company will engage in general passenger and freight business between Havana, Cuba, and Mobile. The capital stock is placed at $40,000.

It is announced from Hamburg that in addition to the ship building project in which King Leopold is interested comes the news that another great enterprise of the same sort is to be established on the River Scheldt. The new company has acquired ninety acres of land for its plant and will operate on a capital of $4,000,000. The great Vulcan works of Stettin is said to be largely interested.

The Hamburg-American line announces that its profits for the year 1899 are 18,000,000 marks, an increase of 4,000,000 marks over the previous year. The company will pay the same dividend of 8 per cent., applying the surplus to reducing the book value of its fleet and to its insurance fund. It is proposed at the next general meeting of the company to increase its capital from 65,000,000 marks to 80,000,000 marks.

Work is progressing favorably in England on the four steamships for the American Line. The Vaderland and Zeeland, building on the Clyde, will each be of 12,000 gross tons. They will be 560 feet long and 60 feet beam. These vessels are for the New York and Antwerp service. Two others, to be known as the Haverford and Merion, will be of 10,000 tons gross and 530 feet long by 59 feet beam.

Mileage tickets of the Central Passenger Association are good on the Nickel Plate road between Buffalo, Chicago or intermediate stations. 32 Mar. 16.

TRADE NOTES.

Mr. E. Nelson, Chicago sales agent for the Bethlehem Steel Co., was in Cleveland a few days ago in the interest of his company.

Messrs. Trautner & Gardner have decided to go into the business of building gasoline launches at Winona, Minn. They will manufacture gasoline engines of their own improved design. The yards will be located at 647 East Third street. This firm built the Idlewild, the fastest steam launch on the Upper Mississippi, which has recently been sold to E. M. Clark at Natchez, Miss. The firm will build a new boat for their own use to take the place of the Idlewild.

The Smooth-On Manufacturing Co., Jersey City, N. J., well known to the marine trade, has just issued an excellent descriptive pamphlet of their compound for shipbuilders and founders. Smooth-on is an iron compound, prepared by an analytical chemist, in powdered form, and when mixed with water to the consistency of a stiff putty possesses the quality of solidifying. As it expands about 10 per cent. in the act of hardening and as it resists the action of steam, heat, water and oil, it is particularly suited to the filling of defects in iron or steel castings.

Letters have been addressed by the Chicago Pneumatic Tool Co. to customers who have purchased Boyer piston air drills, asking if the drills are in good working order and developing full power, and offering to equip the old drills with improvements that have been made since the sales were made. These improvements consist of lately-invented oiling attachments and other devices greatly increasing the life of the drill. This offer is made on account of the desire of the Chicago company to give its customers the full benefit of these improvements.

A sling frame for handling barrel cargoes, and which saves the labor of one man in such work, was described and illustrated in these columns some time ago. As will be noted by an advertisement on page 10 of this issue, the inventor of this device, H. R. Patriarche of Milwaukee, is now prepared for the sale of it. Following a test of this frame a short time ago, the following claims were supported by the captain of one of the Flint & Pere Marquette Ry. steamers as well as two of the contracting stevedores on Milwaukee docks: "Two barrels can be hooked on and handled by one man with this frame as rapidly, easily and safely as two men can do it the old way. The hooks and frame can be cast off in the hold as rapidly and easily as could be accomplished without the frame in position. There is absolutely no tangling of slings or hooks, the hooks always coming to hand in proper position at the ends of frame, no matter how cast off. One barrel can be handled alone without adjustment of any kind, and this can be accomplished with as great speed, ease and safety as is possible in the old way."

At the last meeting of the American Society of Mechanical Engineers, the veteran engine builder, Mr. Chas. T. Porter, in his discussion of Dr. Thurston's paper on "The Steam Engine in the Close of the Nineteenth Century," stated that it is a principle of the "new engineering" that "the boiler furnace shall be independent of natural draft, effectually consuming its smoke, and burning two or more times as much coal per square foot of grate as it could do under natural draft alone, and yet sending off the gases at a low temperature; the boiler being a steam generator, a superheater and a fuel economizer combined." This statement clearly shows Mr. Porter's implicit faith in the future of mechanical draft as a substitute for chimney draft as a means of securing the desired ends.

A catalogue of the Lennox Machine Co., Marshalltown, Iowa, describes their stationary gas and gasoline engines, portable engines and engines and pumps combined. The engines are constructed of material of the very best quality and designed to withstand the most severe pressure.

The River Machine & Boiler Works of Cleveland (Tiere & Thomas) managed to overcome some serious difficulties in providing the Craig Ship Building Co. of Toledo, with a couple of large Scotch boilers for the Welland canal size steamer building for Arthur Hawgood and others of Cleveland. It was necessary to hurry the boilers to Toledo by rail. One railway company that attempted to move them found before leaving Cleveland that, as they were of 12½ feet diameter, they could not even be moved out of the city on flat cars, on account of bridge obstructions. Then a special train was made up by Mr. E. C. Kenney, trainmaster of the Big Four Railway, and by going to Clyde and thence over the Wheeling & Lake Erie, obstructions over the route were avoided sufficiently to finally land the boilers at the Craig works. Messrs. Hawgood and Teare accompanied the train to look after the shifting of the boilers on the cars at several points along the road.

VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.

Quotations furnished by HERBERT WRIGHT & Co., Cleveland, date of March 14. 1900.

NAME OF STOCK.	OPEN	HIGH	LOW	CLOSE
American Steel & Wire.....	56⅝	56⅝	55⅝	56
American Steel & Wire, Pfd.....	92	92	91¾	91¾
Federal Steel	50⅜	50½	49½	50
Federal Steel, Pfd.....	74	74	73½	73½
National Steel	45	45	44¾	44¾
National Steel, Pfd.....	.....	.....	.....	.....
American Tin Plate	33	.....	.....	33
American Tin Plate, Pfd.....	.....	.....	.....	.....
American Steel Hoop.....	35½	35¾	35½	35½
American Steel Hoop, Pfd.....	.....	.....	.....	.....
Republic Iron & Steel	22	22	21⅝	21⅝
Republic Iron & Steel, Pfd	68	68	67⅞	68

SPECIAL ATTENDANTS FOR TRANS-ATLANTIC TRAVELERS.

The bureau of attendants for trans-Atlantic travelers established in Jersey City and New York city twenty years ago by the Pennsylvania system, has proven a great convenience to persons making European trips and to tourists arriving in America at that port. It will be particularly convenient for visitors to the Paris exposition because the departure docks of most of the Atlantic steamship lines are convenient to the new Jersey City passenger station of the Pennsylvania Railroad Co.

This bureau consists of experienced agents whose duties are to meet passengers arriving in Jersey City and New York over the Pennsylvania lines and assist them in arranging for trans-Atlantic trips via any of the steamship lines by conducting them to steamships and aiding in preparations for a trip abroad. These agents will provide cabs operated by the Pennsylvania system and aid passengers with their baggage. They are fully posted on matters pertaining to steamships leaving New York, and arrangements can be made through them for procuring steamship tickets in advance.

They also meet incoming steamships to aid travelers in shaping details for continuing journeys from New York over the Pennsylvania lines by furnishing tickets, arranging for the transfer of baggage from steamship docks after it has been passed by customs inspectors, and having the same checked through to destination. They will reserve sleeping car accommodations and relieve persons of the foregoing details, making themselves useful as attendants and guides free of charge.

Further information on the subject may be obtained by addressing the nearest Pennsylvania lines ticket agent, or C. L. Kimball, assistant general passenger agent, Cleveland. Mar. 22.

The Spedden Ship Building Co. of Baltimore, Md., was the lowest bidder, at $79,873, for the construction of light-ship No. 74 for the Cape Elizabeth station, a description of which was published in the Review three weeks ago. The light-house board, however, decided to re-advertise, as the lowest bid exceeds the appropriation allowed by congress.

The Nickel Plate road has become a member of the Central Passenger Association mileage ticket bureau, and all mileage tickets properly issued by any line a member of that bureau are valid for use on that road in the same manner as on other roads that are members of that bureau. 30 Mar. 16.

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Room 201, Royal Insurance Bldg., CHICAGO.

Long Distance Telephone, Harrison 107.

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ORESTES C. PINNEY,
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W. J. WOOD, Naval Architect, Ship Surveyor,
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Prepares designs or working drawings and specifications for all classes of vessels and superintends construction and repairs. Surveys damaged property and estimates cost of repairs.

Vessels designed—Twin S. S. Virginia, Steam Yacht Comanche, Twin S. S. North West and North Land, I. W. Nicholas, and many others, including Fire Boats, Tugs, Barges, etc.

Complete plans furnished for Steel Composite or Wooden Vessels.

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Inspectors of Shipbuilding Materials and Machinery.
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